# GUADALUPE RIVER
## PLANNING STUDY
## COUNTY MARINA TO SOUTHERN PACIFIC RAILROAD

CONSISTING OF THE

# ENGINEER'S REPORT
AND
# NEGATIVE DECLARATION

MARCH 1983

Santa Clara Valley Water District

ANDERSON-NICHOLS & CO., INC.

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# SANTA CLARA VALLEY WATER DISTRICT

# GUADALUPE RIVER

# FROM COUNTY MARINA TO S.P.R.R. AT ALVISO

Planning Study

Consisting of the

ENGINEER'S REPORT

AND

NEGATIVE DECLARATION

Project Number

3015

Report Prepared by
Anderson-Nichols & Co., Inc.
Supported by
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# ENGINEER'S REPORT

Prepared by

Anderson-Nichols & Co., Inc.

# PREFACE

This is a report on the proposed flood control project on Guadalupe River in the City of San Jose from the County Marina to the Southern Pacific Railroad at Alviso.

This report describes the flooding problem, discusses various alternatives to alleviate the problem, and presents estimated costs and impacts of these alternatives. The report includes a description of the proposed project, and discusses the cost and financing of the project.

This report, including an attached Draft Negative Declaration (ND) and Initial Environmental Study (IES), was circulated to interested parties for review. During the review period, the District Board of Directors received comments on the report, the ND, the IES, and the proposed project at a public hearing. At the conclusion of the hearing on March 8, 1983 the Board approved the project and authorized final design of the recommended improvements.

Anyone with questions about this report or the ND should contact the appropriate person or persons listed in Appendix A, Persons to Contact for More Information.

# SUMMARY

The purpose of the proposed project is to protect the community of Alviso and other areas from freshwater or tidal flooding by Guadalupe River from the County Marina to the Southern Pacific Railroad in Alviso. It will act in conjunction with proposed projects upstream on the Guadalupe River and the proposed ring levee around the north, east and south sides of Alviso.

Several alternative concepts for flood prevention were evaluated as part of this study and previous studies. Ten specific alternatives and several variations for levee strengthening and raising in the study reach were reviewed in detail. The alternative which best balances cost; hydraulic design factors; channel, levee and floodwall maintenance requirements; and environmental considerations is proposed for construction.

The proposed project consists primarily of raising and widening the existing levee between the County marina and the Southern Pacific Railroad (SPRR) in combination with building a new cutoff levee near the west end of Mill Street, building a retaining wall to protect one of the historic cannery buildings, a floodwall to protect the former Union Warehouse, and relocation of the South Bay Yacht Club to allow for levee improvements.

The estimated cost for the proposed project is $1,041,000 which includes: construction, engineering design, administration, overhead, contingencies, and the cost to acquire approximately 2.9 acres of additional right of way. The estimated construction cost is $889,000.

Financing for the proposed project would be derived from the District's share of the County's one percent property tax levy and Benefit Assessment revenue in the Central Flood Control Zone.

# INTRODUCTION

This report presents a discussion of the proposed flood control project for raising and strengthening the Guadalupe River east levee in San Jose in the reach from the County Marina to the Southern Pacific Railroad (SPRR) crossing at Alviso.

## Purpose of Project

This project, working in conjunction with other proposed projects upstream along Guadalupe River and the proposed Alviso Ring Levee will provide the community of Alviso with protection from freshwater and saltwater (tidal) flooding. Under existing conditions, the gravest flooding danger to the people of Alviso would be a sudden, progressive failure of the Guadalupe River east levee somewhere between the marina and the railroad bridge. Some areas of the levee are improperly compacted and some areas have experienced leaking in the past. A major levee failure would allow rapid entry of water into town. It would most likely occur with the river level high due to a very high tide and/or a large flow coming down the river. At such a time the gap in the levee would be fed by saltwater coming up the river from San Francisco Bay as well as fresh water coming down the river from the upper watershed. The water on the Alviso side of the levee would soon rise to the same level as the water in the river. Flooding could extend southerly of Highway 237 all the way to Mobile Parks West, a mobile home park approximately 600 feet south of Highway 237 between North First Street and Zanker Road. The water in town would rise and fall with the tides until the gap could be repaired and the water pumped out. Compared to the overland flow type flooding experienced in recent years, flooding by sudden levee failure would come with little or no warning, be far deeper, would involve swifter currents, and would remain far longer. For these reasons damages would be much greater and loss of life far more likely.

Under existing conditions, the proposed project alone would not prevent flooding of the Alviso area by Guadalupe River. Water could still break out between Highway 17 and Branham Lane upstream of the proposed project and run overland to the Alviso area. In the future, these flows would be contained in the river by the Army Corps of Engineers' proposed Guadalupe River project between Highway 101 and Park Avenue. (The reach from Park Avenue to Branham Lane will be the subject of a future Santa Clara Valley Water District study.)

The proposed project between the marina and the railroad should be constructed before the projects upstream of Highway 101 because the upstream projects will increase peak flows past Alviso. The proposed Alviso Ring Levee would protect Alviso from Coyote Creek overflows, high water in the Bay, and interior drainage from the area between Coyote Creek and Guadalupe River.

## Scope of Report

This report presents a description of the flooding problem, the alternative solutions investigated including estimated costs, and a discussion of the recommended project, its structural elements, costs, and financing.

## Previous Reports

Several previous reports on the flood problems along Guadalupe River and possible methods of flood protection have been prepared by various agencies. These range from early preliminary reports by the County to recent studies by Santa Clara Valley Water District and Federal agencies concerned with flood control.

*In September, 1944, the Engineering Department of the County of Santa* Clara issued the "Preliminary Report on the Guadalupe Creek and Tributaries, Santa Clara County, for Flood Control and Runoff." This report presented rainfall and runoff data collected to that time as well as a topographic map showing flood prone areas and recommendations for channel improvements on Guadalupe River.

In August, 1960, the Santa Clara County Flood Control and Water Conservation District issued the "Engineers Report of Proposed Improvements for Zone C-1, the Central Zone." This report presented a specific program for flood control improvements on Los Gatos Creek from its confluence with Guadalupe River upstream to Saratoga Avenue in Los Gatos and on Guadalupe River from Coyote Creek (at the bay) upstream to Branham Lane. Engineering design, financing and construction staging for these projects were outlined in detail.

In September, 1968, the County of Santa Clara, Department of Public Works, issued a "Preliminary Drainage Report." This report addressed a comprehensive approach to solve the drainage and flood control problems of the county. It stressed the need to improve Guadalupe River and Coyote Creek in their lower reaches to solve problems of subsidence, siltation, and encroachment of development on the floodplain without adequate local drainage.

In January, 1972, the U.S. Army Corps of Engineers issued a "Floodplain Information Study for Guadalupe River from Coyote Creek to Blossom Hill Road." This study discussed in detail the hydrology of the watershed, historic flooding, flood flows and potential future flooding. It presented detailed water surface profiles for floods of various frequencies and maps which delineated the limits of flooding for these floods. No recommendations were made for flood control improvements.

A report prepared by Dr. Andrew H. Trice in April, 1974, entitled "Report on Potential Flood Damages on Guadalupe River, Coyote Creek and Adjacent Streams," presents very detailed estimates of the potential flood damages and inundated areas for Guadalupe River. This report was prepared for the U.S. Army Corps of Engineers in cooperation with the Santa Clara Valley Water District.

A report prepared by George S. Nolte & Associates in 1978, entitled "Draft Flood Insurance Study for the City of San Jose, Santa Clara County," presents a comprehensive evaluation of flooding in Santa Clara County. The purpose of the report was to develop maps defining flood insurance limits within the County. These flood insurance maps are currently in effect.

## Related Projects

The reach of Guadalupe River addressed in this report is only one portion of the river which is presently not adequate to convey the design flood.

The U.S. Army Corps of Engineers is conducting a study of the flood control needs of the entire river. The reach from Highway 101 to Park Avenue is included in their study for channel improvements to contain the one percent flood. The Corps' study plan indicates that if a federal project is justified, construction would commence in the late 1980s.

The Alviso area saltwater flooding downstream of Highway 237 and adjacent to the river is included in another current Corps study, the "San Francisco Bay Shoreline Study". Among other concerns it addresses the proposed raising of the Gold Street bridge over Guadalupe River to accommodate freshwater flood flows and the ring levee around Alviso. The City of San Jose is also considering construction of the ring levee.

An Engineer's Report for Guadalupe River from SPRR to Highway 101 was approved by the Santa Clara Valley Water District in October 1982. It describes the flooding problem, discusses the various alternatives, estimates costs, and describes impacts of the alternatives and the proposed project. The proposed project consists of raising the existing levees from SPRR to 1,500 feet downstream of the Hetch Hetchy Pipeline; construction of an excavated channel with raised levees and a depressed maintenance road along both banks from there to Montague Expressway; construction of a widened channel from Montague Expressway to Trimble Road; and raising the levees from Trimble Road to Highway 101. The proposed project is scheduled for construction beginning in the summer of 1983.

# DESCRIPTION OF THE PROBLEM

This section of this report contains descriptions of the watershed and the river, historic flooding, previous construction, the limits of flooding during the design flood, and potential damages in the Guadalupe River floodplain.

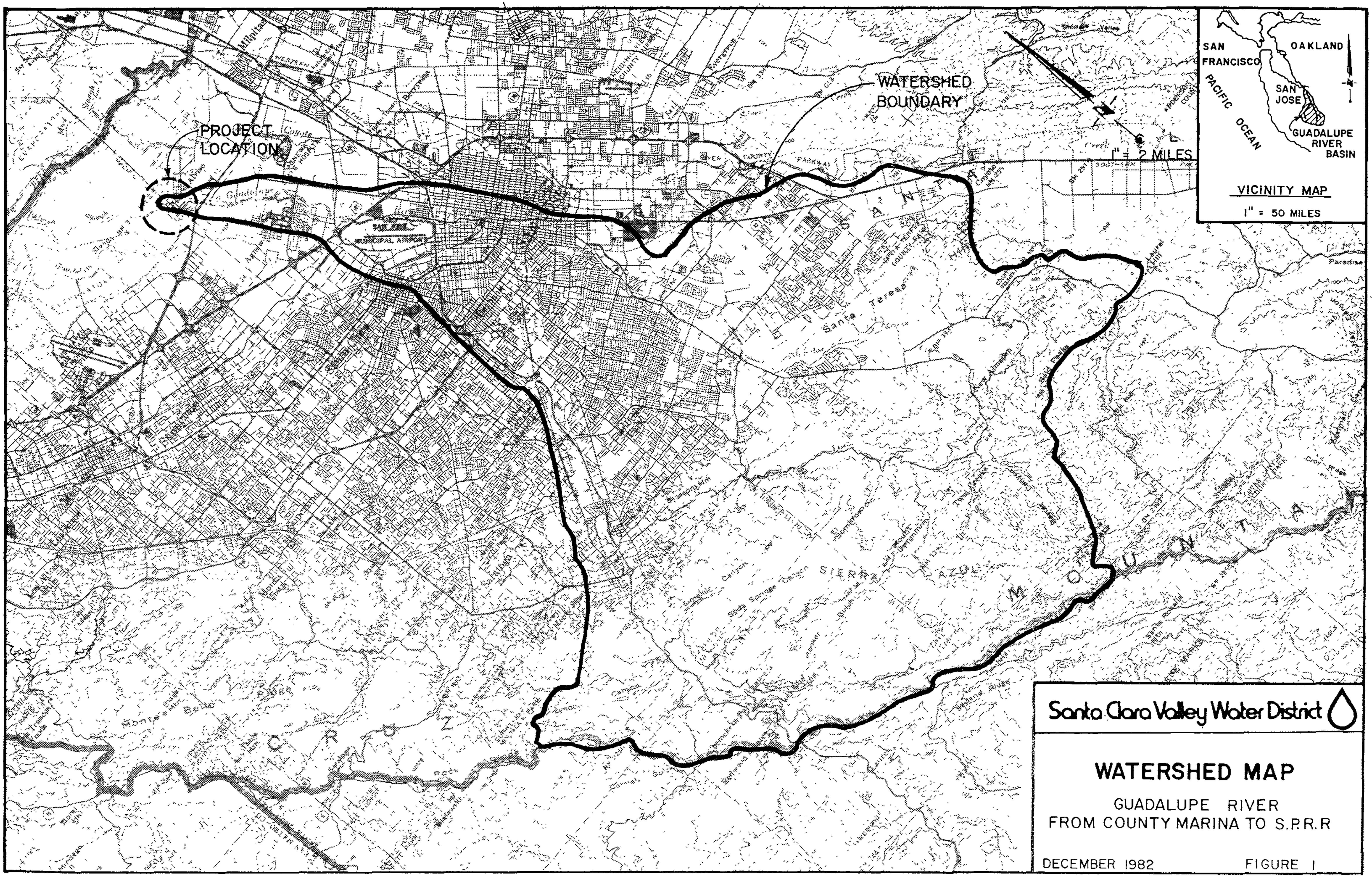
## Location of Problem

The proposed flood control project is located in the northern portion of Santa Clara County at the community of Alviso, a portion of the City of San Jose. The limits of the proposed project are the County Marina on the north and the SPRR on the south. Figure 1 shows the general location of the proposed project and the tributary watershed. Figure 2 shows the specific project location.

## Description of Watershed

Guadalupe River begins at the confluence of Guadalupe Creek and Alamitos Creek in the Almaden Valley, but its tributaries rise in the Santa Cruz Mountains to the south and west. All of the watershed is within Santa Clara County. Watershed elevations range from slightly below sea level to about 3,500 feet above. Three reservoirs in the upper basin, (Calero, Almaden, and Guadalupe) have a combined capacity of 15,680 acre-feet and contribute somewhat to the regulation of peak flows within the basin system. Additional regulation is derived from almost 27,000 acre-feet of reservoir storage on Los Gatos Creek. Guadalupe River flows generally northwestward through the City of San Jose past the community of Alviso and outfalls into Coyote Creek about one and one-half miles east of the mouth of Coyote Creek at San Francisco Bay. The watershed area is bounded by the Coyote Creek basin on the east,the crest of the Santa Cruz Mountains on the south, the San Tomas-Saratoga Creek basin on the west, and San Francisco Bay to the north.

The area has a relatively mild climate; temperatures range from an average high of 81 degrees during July to an average low of 49 degrees in January. Ninety percent of the rainfall occurs in the late fall and winter months. January is usually the month with the most rainfall. Although thunderstorms do occur during the summer months, they do not contribute significantly to the



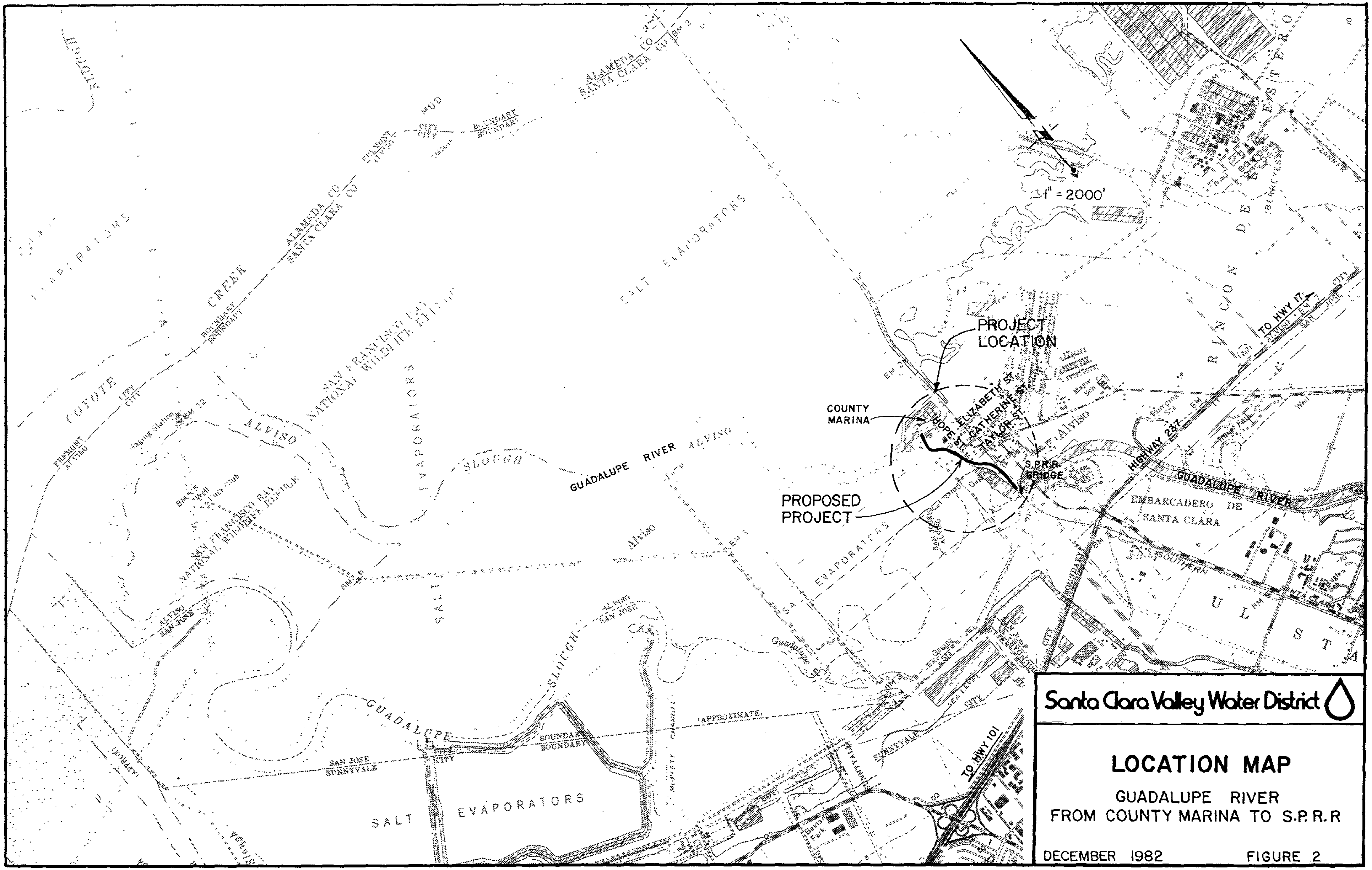
Santa Clara Valley Water District

## WATERSHED MAP

GUADALUPE RIVER
FROM COUNTY MARINA TO S.P.R.R

DECEMBER 1982

FIGURE 1



**Santa Clara Valley Water District**

## LOCATION MAP

GUADALUPE RIVER
FROM COUNTY MARINA TO S.P.R.R

DECEMBER 1982

FIGURE 2

annual precipitation. Mean annual precipitation within the basin varies from 56 inches in the Santa Cruz Mountains above Almaden Reservoir to 15 inches in San Jose.

The upland mountainous drainage area of Guadalupe River has soils developed on sedimentary, basic igneous, and serpentine rocks. Soils are shallow to deep and are located on steep to very steep slopes with good drainage. Vegetative cover includes grasses, oak, pine, brush, and hardwood. Infiltration of water into these upland areas is classified as very low.

The soils in the lowland valley and foothill areas are shallow to moderately deep. In general, they drain relatively well and have a moderate water infiltration rate. Some erosion has occurred in the stream channels and banks during periods of high runoff.

The soils in the project area are as described in the project Geotechnical Report, prepared by Woodward-Clyde Consultants and dated January 13, 1983.

The upland portion of the watershed has very little development at this time. The County General Plan calls for only nominal development there in the future, leaving mostly open space. The valley floor portion has been actively developed in the past 20 years and includes subdivisions, shopping centers, and light industry. The County and City General Plans allow almost total urbanization which will likely occur.

Land uses in the Alviso area are residential, commercial, light industrial, and agricultural. Land use is not changing at present due to building restrictions imposed because the Alviso area lies within the limits of the one percent flood. Land downstream of Alviso is devoted entirely to use as salt evaporators. Almost all of the salt evaporators lie within the National Wildlife Refuge.

The watershed characteristics discussed in this section, i.e., soil type, urban development, reservoir storage, together with the general hydrology of the area, have been considered in developing the design flood flows for the proposed flood control measures described in this report.

## Previous Construction

When the early settlers arrived in the Santa Clara Valley, Guadalupe River apparently entered San Francisco Bay through what is now called Guadalupe Slough, and Alviso Slough effectively dead-ended just north of Alviso. In about 1858 the river was blocked off from Guadalupe Slough and connected to Alviso Slough. The point of blockage appears to be the horseshoe-shaped cove across the river from the South Bay Yacht Club. The connection appears to be the reach from the yacht club to about the marina entrance.

In 1965 the District widened the channel from the SPRR to Taylor Street, cutting off two sharp bends. At about that time the Gold Street Bridge was built and the Eldorado Street Bridge was removed. In 1971 a new SPRR bridge was built and the old bridge removed. The County Marina was built in the late 1960's.

Over the years levees have been built along both banks of the Guadalupe River past Alviso and on down to the bay. This construction has been sporadic and, apparently, has been in reaction to periodic floods and to long term subsidence of the valley floor. Few, if any, records of this work survive. Sloughing and sedimentation have contributed to the present shape of the channel which consists of a fairly regular shallow, triangular main waterway with irregular slopes above.

During the fall of 1982 the low spots in the east levee from the SPRR to the County Marina were raised to Elevation 9.0 NGVD. This work was performed by District Staff as a maintenance operation.

## Historic Flooding

The Alviso area and the surrounding lands have been subject to many floods since they were originally settled late in the eighteenth century. Recent flooding has been well documented by various government agencies and in newspaper articles. Previous flood control work on Guadalupe River and elsewhere in its watershed has reduced the frequency of flooding.

On January 8-9, 1971 leakage occurred through the Guadalupe River east levee near Elizabeth Street in Alviso. Water flowed through the leak only during higher tides. It was suspected of being due to rodent burrows.

In early January 1973, a large crack developed in the top of the east levee next to the South Bay Yacht Club. On January 11 a leak developed in that area. The District made repairs by placing imported embankment material against the east face of the levee. Until it was removed a few months later, this material effectively blocked all Hope Street traffic past the yacht club.

On January 10, 1978 a slipout was noted in the east face of the east levee in front of the South Bay Yacht Club. Several rotten timbers appearing to be part of an old crib wall were exposed. From three to five gallons per minute of clear water leaked through the levee at the slipout during higher tides. Later that year the District repaired the slipout and installed nine foot high gabion slope protection on the land side for about 60 feet.

Also on January 10, 1978 a sinkhole about two feet in diameter was noted at the end of Catherine Street. It was filled by City of San Jose staff.

On February 7, 1978 a combination of small flood flows in the river and high San Francisco Bay tides and winds caused very minor overtopping of the east levee at three locations in Alviso. These points were about 75 feet upstream of Catherine Street, immediately upstream of Catherine Street, and about 600 feet downstream of Catherine Street where an extension of Mill Street climbs the levee.

The largest recent flood on Guadalupe River occurred in April 1958. The April 2 peak discharge of 9,150 cfs is the largest ever recorded at the Guadalupe River stream gage (U.S. Geologic Survey Gage 11169000 Guadalupe River at San Jose, which is 100 feet downstream from the Los Gatos Creek confluence). As a result, flooding occurred in Alviso at depths up to about four feet, and in San Jose including a two-block area northerly of Highway 17. Major damages occurred in the basin's agricultural areas, mostly pear orchards, and all of Alviso which was inundated for 17 days.

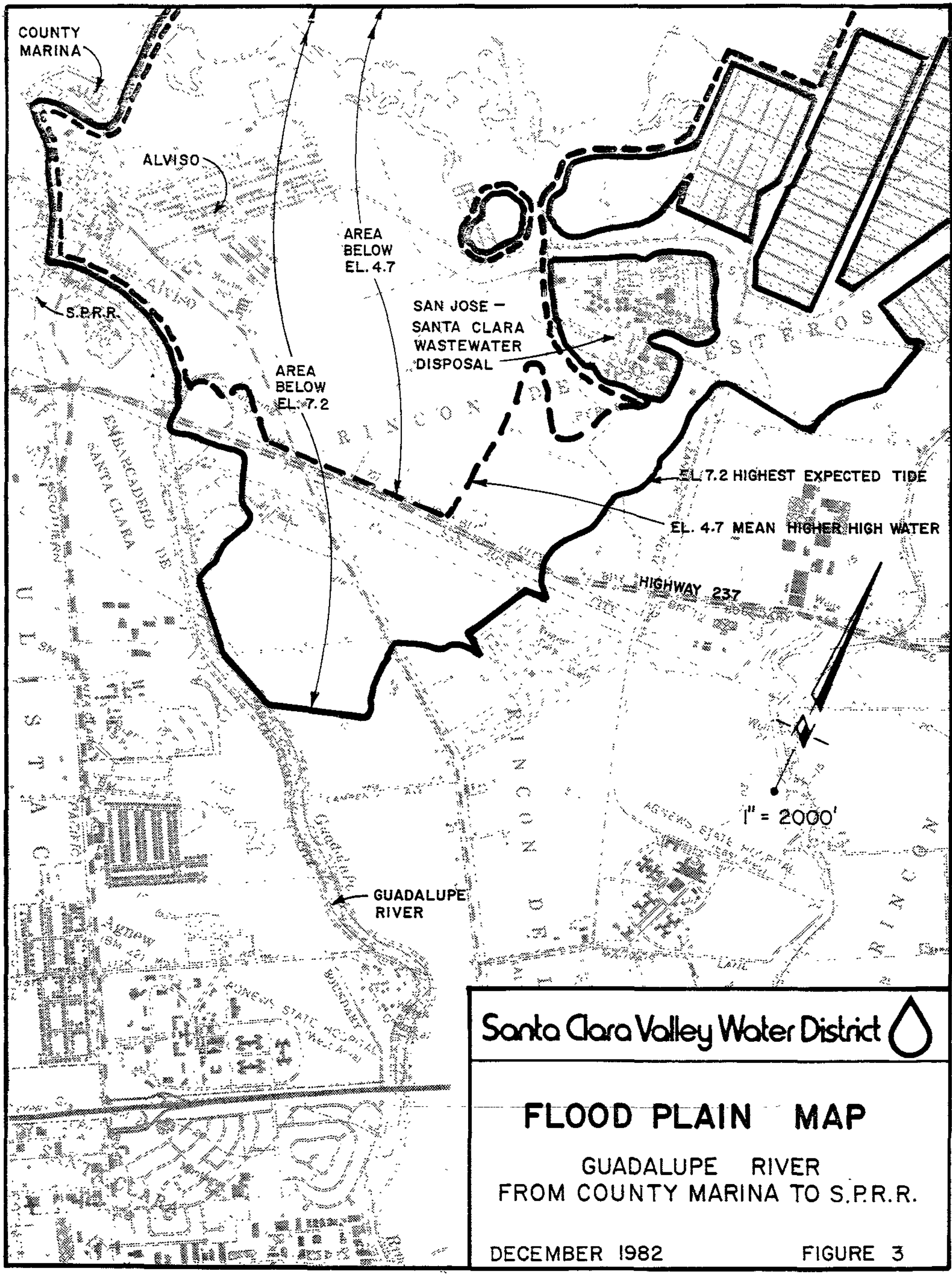
In December 1955, a peak discharge of 5,750 cfs inundated about 5,000 acres between Brokaw Road and Alviso, and practically the entire town of Alviso was under water at depths up to five feet.

Another major flood occurred in February 1940. The peak discharge resulting from this storm was 8,680 cfs. Approximately 3,200 acres of agricultural land and the community of Alviso were flooded.

In more recent years the flow in the river from the SPRR upstream to Highway 101 has risen to within one foot from the tops of the banks, but did not spill over them. However, local flooding occurred next to the river because the high water level in the river did not allow the local systems to drain.

Upstream of Highway 101, overtopping and near overtopping have occurred recently as a result of only moderately intense storms. During the February 13-22, 1980 storms, overtopping occurred just upstream of Alma Avenue. During the January 4, 1982 storm, the river flowed bank full there but did not overtop. On March 31, 1982, overtopping upstream of Alma Street caused flooding along the river to Virginia Street. Several homes and businesses including the Elks Club and Alma Golf Course were inundated with mud laden flows.

Figure 3 shows for the Alviso vicinity where the limits of the Highest Expected Tide (HET) (Elevation 7.2 NGVD) and Mean Higher High Water (MHHW) (Elevation 4.7 NGVD) would be, should the existing easterly Guadalupe River levee fail in the project reach. For a discussion of NGVD, HET, MHHW, and


COUNTY MARINA
ALVISO
S.P.R.R.
AREA BELOW EL. 4.7
AREA BELOW EL. 7.2
SAN JOSE — SANTA CLARA WASTEWATER DISPOSAL
EL. 7.2 HIGHEST EXPECTED TIDE
EL. 4.7 MEAN HIGHER HIGH WATER
HIGHWAY 237
RINCON DE LOS ESTEROS
EMBARCADERO DE SANTA CLARA
ULISTAC
GUADALUPE RIVER
1" = 2000'

Santa Clara Valley Water District

# FLOOD PLAIN MAP

## GUADALUPE RIVER
## FROM COUNTY MARINA TO S.P.R.R.

DECEMBER 1982

FIGURE 3

Mean Lower Low Water (MLLW), see Appendix B, Basis for Elevation. The 1940 and 1958 floods were not due to a levee overtopping in the project area but did cover all but the most southerly portion of Figure 3. The Federal Insurance Administration (FIA) flood limits include all the area shown on Figure 3 with the exception of the area west of Guadalupe River between Highway 237 and Montague Expressway.

Table 1 lists the largest peak flood flows which have occurred at the Guadalupe River stream gage. Guadalupe River flows at Alviso are essentially equal to those at the stream gage.

TABLE 1

HISTORIC FLOOD FLOWS*

| Water Year | Date | Peak Discharge cfs |
|---|---|---|
| 1932 | 12/27/31 | 6,700 |
| 1937 | 02/13/37 | 6,070 |
| 1938 | 12/11/37 | 6,660 |
| 1940 | 02/27/40 | 8,680 |
| 1941 | 04/04/41 | 6,330 |
| 1943 | 01/23/43 | 6,350 |
| 1945 | 02/04/45 | 6,600 |
| 1952 | 01/12/52 | 8,000 |
| 1956 | 12/23/55 | 5,570 |
| 1958 | 04/02/58 | 9,150 |
| 1963 | 10/13/62 | 6,300 |
| 1967 | 03/06/67 | 6,760 |
| 1968 | 01/30/68 | 5,170 |
| 1978 | 01/14/78 | 6,430 |
| 1980 | 02/19/80 | 7,910 |
| 1982 | 03/31/82 | 7,180 |

*Peak flows recorded at USGS Stream Gaging Station on right bank 100 feet downstream of Los Gatos Creek, established in 1930.

## Design Flood

The proposed flood control project, which will be described in detail in a later section, has been designed to convey a "one percent flood" with freeboard conforming to the Federal Insurance Administration (FIA) interim levee policy. This policy requires a freeboard of three feet for levees, with an additional one foot of freeboard for 100 feet upstream and downstream of bridges. The "one percent flood," also referred to as the "100-year flood," is the peak discharge in the river which could be expected to be equalled or exceeded once in one hundred years. It is the peak discharge which has a one percent chance of being equalled or exceeded in any one year. For the Guadalupe River in the project reach, the District has adopted the U.S. Army Corps of Engineers (Corps) one percent flood of 17,000 cfs to make the project's design compatible with the future upstream Corps project. This value assumes that all upstream reaches of Guadalupe River have been improved so as to be capable of containing their respective one percent flows. For a more complete description of the one percent flood turn to Appendix C.

For calculating one percent Guadalupe River water levels at Alviso, three flow conditions were considered:

(1) One percent discharge in Guadalupe River at SPRR bridge (17,000 cfs) with San Francisco Bay at mouth of River at MHHW (Elevation 4.7 NGVD).

(2) Ten percent discharge in Guadalupe River at SPRR bridge (11,000 cfs) with San Francisco Bay at mouth of River at HET (Elevation 7.2 NGVD).

(3) 11,000 cfs Discharge in Guadalupe River at SPRR bridge with San Francisco Bay at mouth of River at MHHW.

Condition (1) represents a one percent event. It can occur at Alviso only with upstream reaches improved to convey the full 17,000 cfs one percent discharge downstream to the SPRR bridge. Existing conditions upstream limit flows within the river at the bridge to about 11,000 cfs. Condition (2) is considered an alternative one percent event because occurrence of HET is less common than occurrence of MHHW. It can occur with or without upstream improvements. Condition (3) represents a ten percent event and can occur with or without upstream improvements. It also represents the form Condition (1) would take at present due to upstream conditions. In other words, Conditions (1) and (2) represent alternative one percent events for anticipated future conditions; Condition (2) represents the one percent event for existing conditions; and Condition (3) represents the ten percent event for both future and present conditions.

The various flow conditions were considered for existing physical conditions and also for physical conditions with the proposed project. Existing physical conditions include the recent raising of the east levee from SPRR to the marina to a minimum elevation of 9.0 NGVD. Calculations used the Corps' HEC-2 backwater computer program. The one percent discharge hydrograph used was developed by the San Francisco District of the Corps. A ten percent hydrograph was developed from the one percent hydrograph by multiplying by 11/17. Flow over the tops of levees was assumed to behave as though passing over a broad-crested weir having a discharge coefficient of 2.8. It was assumed that levee crests would not erode. Through an iterative process for each combination of flow condition and physical condition, the flows in various reaches of the river and the flows over various reaches of levee were balanced. Comparing these flows with the hydrographs determined the duration of levee overtopping at each overtopping point. The volumes of overtopping flow could then be calculated.

Table 2 presents the results of this iterative backwater and overflow weir process for the existing physical conditions. (The results for the proposed project physical conditions were used to set the proposed levee and floodwall heights and are discussed in a later section.) The first of the three flow conditions in Table 2 assumes that all upstream Guadalupe River reaches have been improved sufficiently to convey the full 17,000 cfs downstream to the SPRR bridge. In this case 1,100 acre feet of Guadalupe River water overtops the existing east bank levee about 200 to 300 feet downstream of the SPRR bridge. This volume would cover the community of Alviso to an average depth of about three feet.

The Table 2 values for the second flow condition are applicable whether or not any upstream improvements have been made. In this case the volume of east levee overflow from 200 to 300 feet downstream of the SPRR bridge is reduced to 170 acre feet.

The Table 2 values for the third flow condition represent the Guadalupe River flow of the first condition without any upstream improvements. While only 120 acre feet overtop the east levee downstream of the railroad bridge, a much larger volume will overtop upstream reaches of the east levee and flow overland to Alviso from the south.

## TABLE 2

## ONE PERCENT FLOOD OVERFLOWS WITHOUT PROJECT

Flow Condition

| Location | One Precent Discharge Bay at MHHW | | Ten Percent Discharge Bay at HET | | Ten Percent Discharge Bay at MHHW | |
|---|---|---|---|---|---|---|
| | Peak Overflow Discharge (cfs) | Total Volume (Acre Feet) | Peak Overflow Discharge (cfs) | Total Volume (Acre Feet) | Peak Overflow Discharge (cfs) | Total Volume (Acre Feet) |
| EAST LEVEE | | | | | | |
| From 200 to 300 feet downstream of SPRR | 1,000 | 1,100 | 200 | 170 | 100 | 120 |
| Total East Levee Overflow | | 1,100 | | 170 | | 120 |
| WEST LEVEE | | | | | | |
| Across river from South Bay Yacht Club | 4,000 | 5,400 | 2,100 | 2,300 | 1,400 | 1,200 |
| Across river from end of Mill Street | 1,000 | 1,100 | 400 | 600 | 100 | 30 |
| Total West Levee Overflow | | 6,500 | | 2,900 | | 1,230 |

## Potential Flood Damages

In the Alviso area flooding is due to one of, or any combination of, the following:

- Guadalupe River water overtopping the east bank in downtown San Jose and flowing northward overland to Alviso.
- Coyote Creek water overtopping the west bank at or downstream of Montague Expressway and flowing northwesterly overland to Alviso.
- Local runoff from the watershed north of downtown San Jose and lying between the Guadalupe River and Coyote Creek levees. During a flood, water levels in Guadalupe River and Coyote Creek are above the surrounding land so local runoff cannot flow into either river unless it is pumped.
- Guadalupe River water overtopping (or passing through a failed section of) the east levee at Alviso. This water would be trapped in Alviso by the Guadalupe River levee on the west, the salt evaporator levees on the north, and high ground on the south.
- Saltwater flooding from San Francisco Bay northerly of Alviso.

A Guadalupe River Levee overtopping followed by levee failure presents by far the greatest potential for flood-related property damage, personal injury, and loss of life at Alviso. The other sources of flooding would allow longer warning times, shallower depths of flooding, slower currents, and smaller volumes of water. Under these circumstances, pumping can begin as soon as the river water level begins to drop. In contrast, a failure of the Guadalupe River levee would occur suddenly and would have to be repaired before pumping could begin.

As discussed under the previous heading "Design Flood", the one percent event will overtop portions of the existing east and west levees between the County Marina and the SPRR bridge, flooding Alviso and the salt evaporators. This will happen whether or not any or all upstream improvements have been built. Overtopping a levee can lead to a rapid, progressive failure by erosion.

The potential damages from a one percent flood from Guadalupe River under present conditions have been estimated by the Corps of Engineers in June 1980 to be about $61,000,000 which includes damages to approximately 6,000 structures. Selected historic damages are listed in Table 3. It is estimated that for existing conditions approximately $2,000,000 in annual premiums will eventually have to be paid by the property owners within FIA's flood limits for Guadalupe River under the Federal Flood Insurance program. Improvement of the entire river by the District and the Corps of Engineers will relieve this insurance requirement.

TABLE 3

HISTORIC FLOOD DAMAGES 1/

| Flood Damage Category | Damages in Dollars 2/ | | |
|---|---|---|---|
| | Dec. 1955 | April 1958 | Jan. 1963 |
| Agricultural | $246,600 | $192,000 | 3/ |
| Residential | 56,000 | 217,000 | $20,300 |
| Commercial | 183,000 | 625,000 | 3/ |
| Industrial | 126,200 | 22,000 | 3/ |
| Public Facilities | 141,700 | 292,000 | 3/ |
| TOTAL | $753,500 | $1,348,000 | $295,000 |

1/ Flood damage data obtained from U.S. Army Corps of Engineers Flood Reports for listed years.

2/ The damages are for the entire river from its mouth to Blossom Hill Road, but do not include damages on the tributaries.

3/ A further breakdown of 1963 damages is not available.

## ALTERNATIVE FORMULATION

The various alternatives were formulated to meet a common set of functional requirements. Each alternative was developed to the point where its constructability could be confirmed and its costs estimated. Each meets engineering criteria based on the functional requirements, existing geotechnical conditions, and good engineering practice. To allow the convenience of a "building block" approach to alternative formulation, the Guadalupe River east bank was subdivided into five reaches between SPRR and the County Marina. The limits of these reaches were selected so that any alternative or "building block" developed for one reach could be combined with any combination of alternatives for the other four reaches.

### Functional Requirements

The basic functional requirement for any alternative for any reach of this project is to provide the FIA required freeboard above the design flood water surface in Guadalupe River. Other requirements include public access to the river, access for project maintenance, access for enforcement of regulations, and provisions for continuous operation of existing streets and utilities.

Guadalupe River design flood water surface elevations were obtained from hydraulic backwater calculations assuming the project has been built and the following two one percent conditions:

1. One percent discharge in Guadalupe River at SPRR bridge (17,000 cfs) with San Francisco Bay at mouth of river at MHHW (Elevation 4.7 NGVD).

2. Ten percent discharge in Guadalupe River at SPRR bridge (11,000 cfs) with San Francisco Bay water level at mouth of river at HET (Elevation 7.2 NGVD).

At any point along the project the higher of the two calculated water levels was used.

State Lands Commission, State Fish and Game, and Federal Fish and Wildlife all desire vehicular access to, and along the top of, the raised levee for enforcement of regulations. The District requires similar access for inspection and maintenance. Public vehicular access is also to be maintained to the public dock at the foot of Catherine Street.

Access must be maintained to those boat moorings which are authorized by State Lands Commission. Authorized moorings consist of (only) the floats at South Bay Yacht Club, temporary mooring at the Catherine Street public dock, the floats at the Fish and Wildlife property west of the end of Mill Street, and the barge mooring at the Fish and Wildlife property near the County Marina boat launching ramp.

In addition, many public agencies desire a pedestrian trail the length of the project. Some have expressed interest in a bicycle trail as well.

Minimum vehicular access requires a 12 foot levee top width. Wherever possible, a minimum 18 foot width should be used to allow vehicles to pass. Pedestrian only access can be provided with a 6 foot width.

The Catherine Street dock is privately owned and is operated as a public dock under an agreement with the City of San Jose. It was built in 1967. As a public dock, anyone can use it upon payment of a fee. Physically, it consists of an 80 foot long bulkhead to which barges are moored for loading and unloading. Use is sporadic. Loads are almost always large and/or heavy enough to require permits to travel over State highways. They are usually mounted on heavy duty dollies and are rolled on and off of the barges. Other times they are transferred to or from barges by a large truck crane. Past loads have included kiln subassembles for the Permanente quarry, Trident missile subassemblies for Lockheed, and houses. Loads planned for the future include bulk sand and gravel. Requirements to maintain use of the dock include a space not steeper than 5 percent extending at least 35 feet back from the face of the bulkhead and space to park a large truck within 10 feet of the 35 foot wide space. Dock access ramps should be at least 24 feet wide.

## Engineering Criteria

Engineering criteria for earthwork are based on the Geotechnical Report. They consist primarily of requirements for scarifying and recompacting existing soil, overexcavation in some areas, allowance for possible future differential settlement, provision of toe drains along the land side of the higher existing embankments, penetration depths for piles and sheetpiling, allowable soil pressures for spread footings, and a maximum new embankment slope of 2:1 (horizontal to vertical).

As discussed in the Geotechnical Report, the 100 year earthquake may be expected to cause some deformation of embankments in the Alviso area while the maximum credible earthquake is likely to cause total failure. Such deformations or failures would be due to either shear failure of underlying bay mud or liquefaction of underlying sand layers. The only way to prevent either would be to improve subsurface conditions which would be prohibitively expensive and not likely to be cost effective. At any rate, the coincidence of high water levels in Guadalupe River with the 100 year earthquake would be an event having a significantly greater return period than 100 years. Therefore no additional measures are recommended to increase resistance of embankments to earthquake.

Maximum velocities along the edge of the channel during major flows do not exceed 3.9 feet per second, so no special bank protection is needed. However, those alternatives raising the existing levee around the Fish and Wildlife property (Reach 1) do require protection from wave action along the most exposed 300 feet of length.

Structural calculations used to size alternatives sufficiently to estimate costs were in conformance with the Uniform Building Code. Reinforced concrete design was based on ultimate strength methods and steel design on working stress design. For final project design, reinforced concrete analysis techniques should consider crack control to reduce contact of reinforcement by brackish water.

### Basis for Costs

All construction costs were based on anticipated bid prices in the Northern California area for the summer of 1983. Mobilization was taken as 5 percent of the sum of the itemized construction costs and contigencies were calculated as 10 percent of the same sum. Engineering, legal and administrative cost was calculated as 18 percent of the resulting total construction cost (itemized construction costs plus mobilization and contingencies). Right-of-way costs were prepared by the District Right of Way Staff, and were combined with the total construction cost and the engineering, legal and administrative cost to produce a total project cost.

Imported embankment material was assumed to come from a site along the west bank of Coyote Creek between Montague Expressway and Highway 237. The City of San Jose obtained this parcel for flood control purposes. Excavation will be conducted in such a way as to not cause drainage problems and will be limited in depth and extent so as not to affect the selection of the alternative project planned by the District for this reach of Coyote Creek. Further investigations of the suitability of the soil for levee embankment will be conducted during the design phase of this project. It is anticipated that there will be sufficient suitable material.

Detailed cost estimates for all alternatives are presented in Appendix D on a reach by reach basis.

## Description of Reaches

Project control line stationing for this Engineer's Report increases moving upstream. (The control line stationing for the Geotechnical Report increases in the opposite direction, starting at 10+00 at SPRR.) The five reaches referred to throughout this report are described in Table 4. All elevations are based on the 1929 National Geodetic Vertical Datum (NGVD) which is 0.3 foot below Mean Sea Level (MSL) at the Golden Gate.

TABLE 4

DESCRIPTION OF REACHES

| | Limits of Reach | |
|---|---|---|
| Reach No. | Stations | Description |
| 1 | 995+57 to 998+55 | County marina to Mill Street |
| 2 | 998+55 to 1003+95 | Mill Street to 250 feet downstream of Catherine Street |
| 3 | 1003+95 to 1007+20 | 250 feet downstream of Catherine Street to Catherine Street |
| 4 | 1007+20 to 1010+90 | Catherine Street to Taylor Street |
| 5 | 1010+90 to 1021+42 | Taylor Street to SPRR |

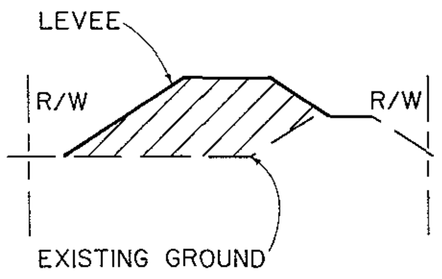
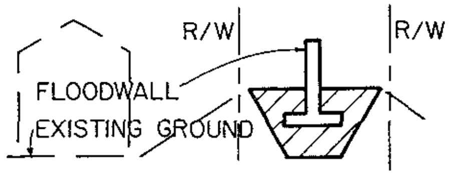
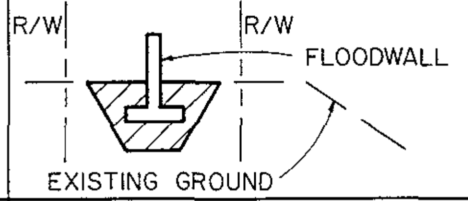
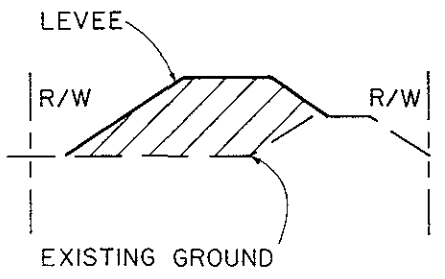
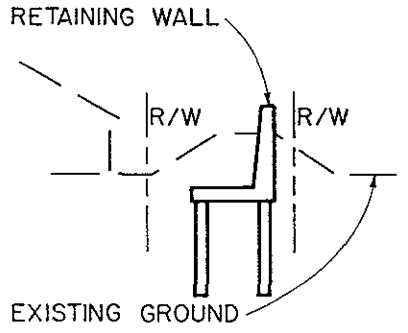
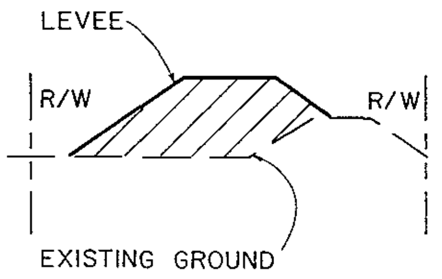
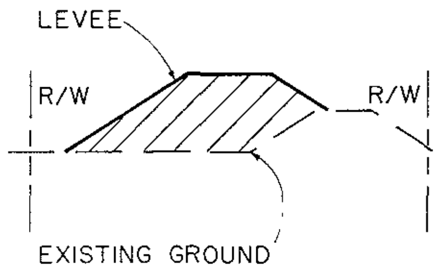
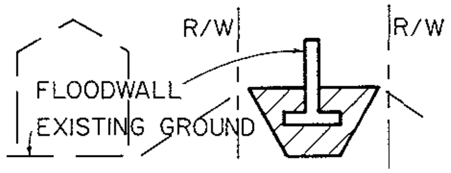
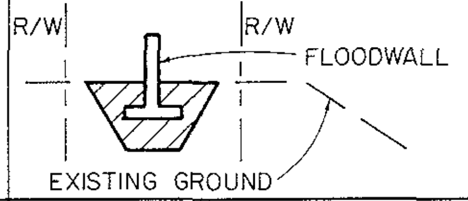
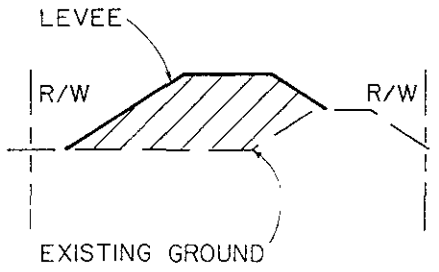
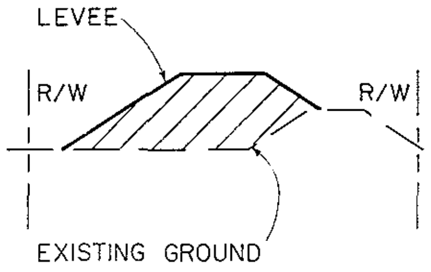
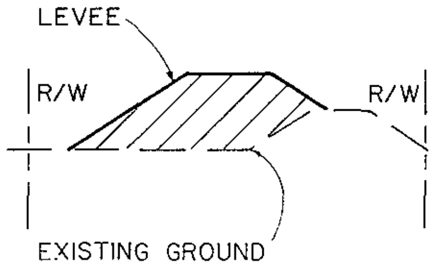
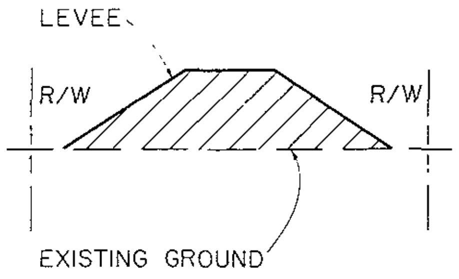
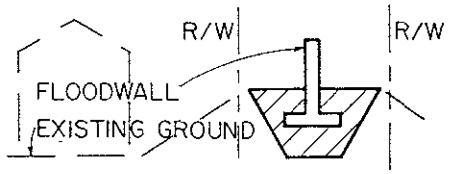
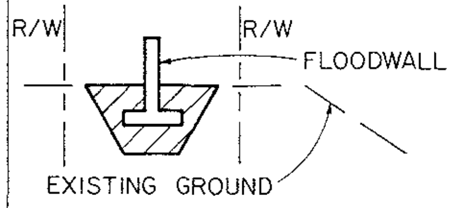
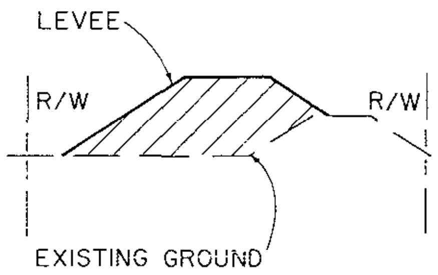
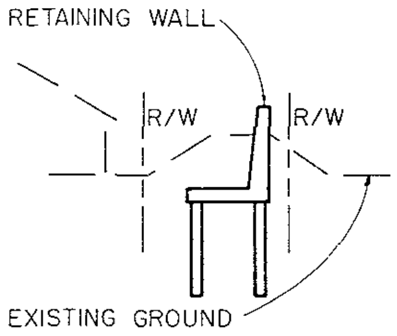
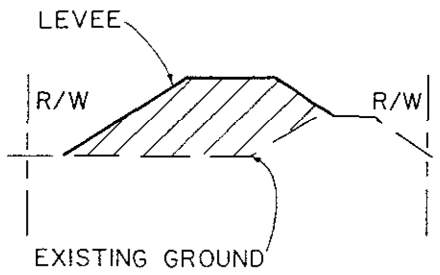
## Formulated Alternatives

Figure 4 (consisting of 4 sheets) shows typical sections for the ten formulated alternatives by reach. Alternatives A through D1 (A, A1, B, B1, C, C1, D, and D1) provide protection through various combinations of levee raising, floodwalls, and retaining walls. Alternative E provides protection through driving sheetpiling into the existing levee and casting a concrete cap on top of it. The nine alternatives A through E are based on not disturbing the portion of the face of the levee toward Guadalupe River below elevation 7, either during or after construction. Alternative F, on the other hand, is a

## TYPICAL CROSS SECTIONS FOR ALTERNATIVES

## FIGURE 4

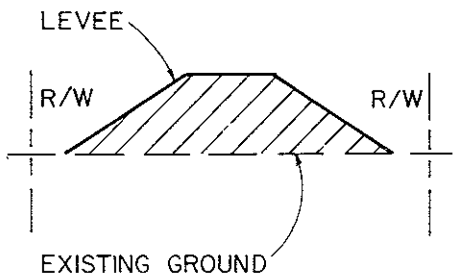
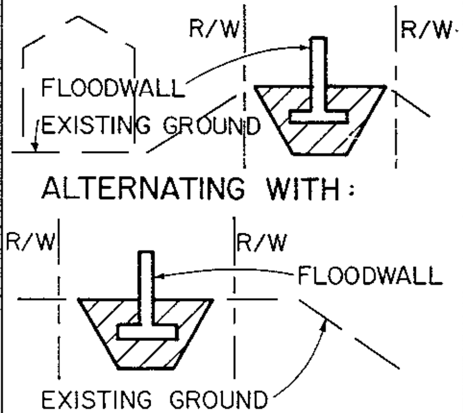
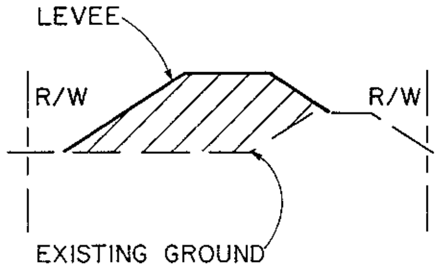
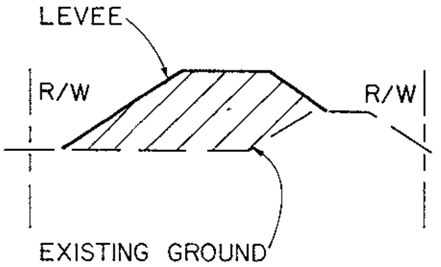
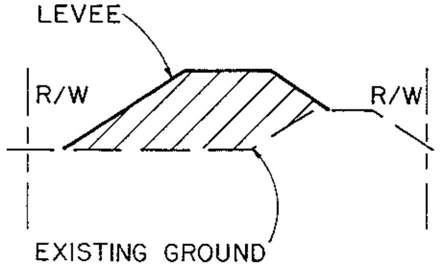
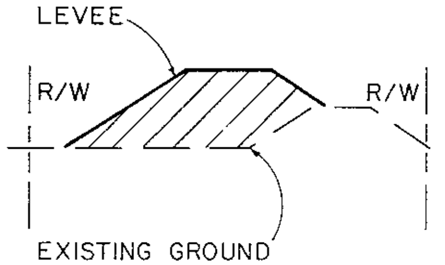
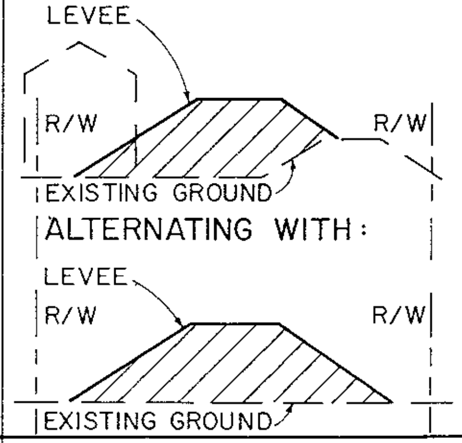
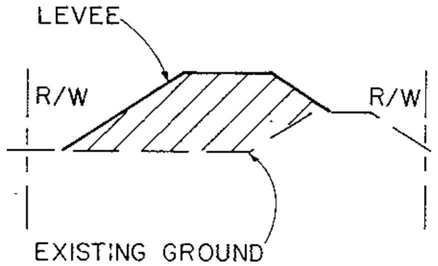
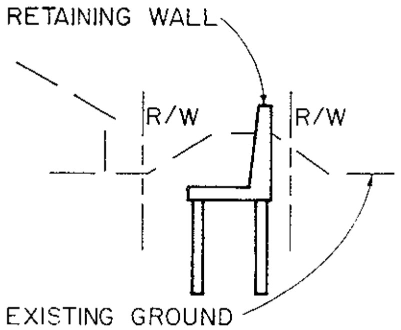
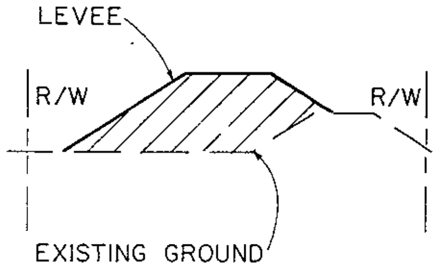
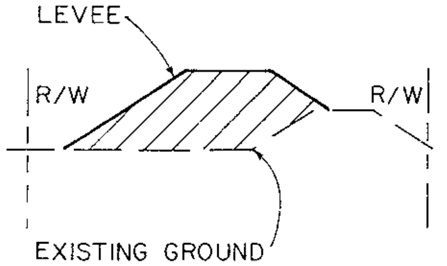
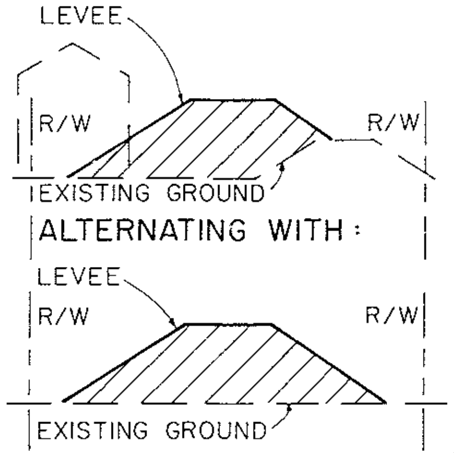
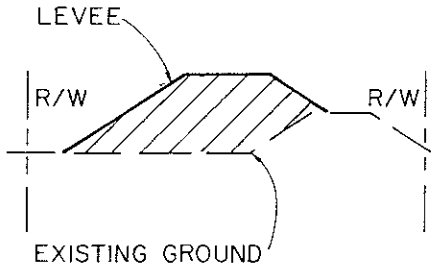
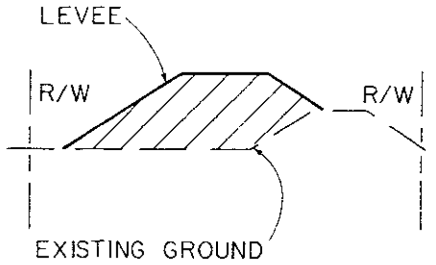
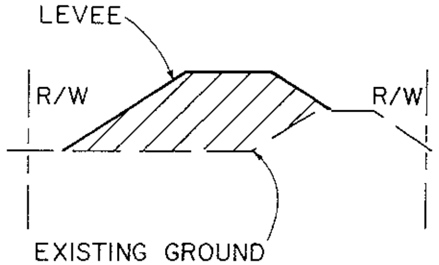
(SECTIONS LOOKING UPSTREAM)

| REACH: 1<br>MARINA PARKING TO MILL ST. | 2<br>MILL ST. TO 250' DOWNSTREAM OF CATHERINE ST. | 3<br>250' DOWNSTREAM OF CATHERINE ST. TO CATHERINE ST. | 4<br>CATHERINE ST. TO TAYLOR ST. | 5<br>TAYLOR ST. TO S.P.R.R. | COST SUMMARY | FEATURE SUMMARY<br>O ADVANTAGES<br>OO DISADVANTAGES |
|---|---|---|---|---|---|---|
| RAISE EXISTING LEVEE  | BUILD FLOODWALL ON TOP OF EXISTING LEVEE  ALTERNATING WITH:  | RAISE EXISTING LEVEE  | BUILD RETAINING WALL IN EXISTING LEVEE  | RAISE EXISTING LEVEE  | CONSTRUCTION COST $1,216,800<br>RIGHT-OF-WAY COST 212,000<br>ENGINEERING AND ADMINISTRATION COST 219,200<br>TOTAL $1,648,000 | **A**<br>OO VISUALLY BLOCKS OFF WILDLIFE REFUGE PENINSULA FROM WATER<br>OO COVERS LARGE AREA OF PENINSULA WITH FILL<br>O PROTECTS WILDLIFE REFUGE PENINSULA FROM ONE PERCENT FLOOD<br>OO POSSIBLE DAMAGE TO FRESHWATER MARSH SOUTH OF TAYLOR STREET<br>O ALLOWS HISTORIC BUILDINGS TO REMAIN<br>OO DOES NOT PERMIT FULL LENGTH VEHICULAR ACCESS |
| (SAME AS A)<br>RAISE EXISTING LEVEE  | (SAME AS A)<br>BUILD FLOODWALL ON TOP OF EXISTING LEVEE  ALTERNATING WITH:  | (SAME AS A)<br>RAISE EXISTING LEVEE  | RAISE EXISTING LEVEE & RELOCATE YACHT CLUB & HOPE STREET  | (SAME AS A)<br>RAISE EXISTING LEVEE  | CONSTRUCTION COST $ 887,200<br>RIGHT-OF-WAY COST 242,000<br>ENGINEERING AND ADMINISTRATION COST 159,800<br>TOTAL $1,289,000 | **A-1**<br>OO VISUALLY BLOCKS OFF WILDLIFE REFUGE PENINSULA FROM WATER<br>OO COVERS LARGE AREA OF PENINSULA WITH FILL<br>O PROTECTS WILDLIFE REFUGE PENINSULA FROM ONE PERCENT FLOOD<br>OO POSSIBLE DAMAGE TO FRESHWATER MARSH SOUTH OF TAYLOR STREET<br>O ALLOWS HISTORIC BUILDINGS TO REMAIN<br>O FULL LENGTH VEHICULAR ACCESS |
| NEW LEVEE CUTTING ACROSS PENINSULA  | (SAME AS A)<br>BUILD FLOODWALL ON TOP OF EXISTING LEVEE  ALTERNATING WITH:  | (SAME AS A)<br>RAISE EXISTING LEVEE  | (SAME AS A)<br>BUILD RETAINING WALL IN EXISTING LEVEE  | (SAME AS A)<br>RAISE EXISTING LEVEE  | CONSTRUCTION COST $1,108,600<br>RIGHT-OF-WAY COST 117,000<br>ENGINEERING AND ADMINISTRATION COST 200,400<br>TOTAL $1,426,000 | **B**<br>O LEAVES PENINSULA IN WILDLIFE REFUGE OPEN TO WATER<br>O SECOND LEAST LAND AREA REQUIRED<br>OO LEAVES PENINSULA WITHIN LIMITS OF ONE PERCENT FLOOD<br>OO POSSIBLE DAMAGE TO FRESHWATER MARSH SOUTH OF TAYLOR STREET<br>O ALLOWS HISTORIC BUILDINGS TO REMAIN<br>OO DOES NOT PERMIT FULL LENGTH VEHICULAR ACCESS |

# TYPICAL CROSS SECTIONS FOR ALTERNATIVES

# FIGURE 4

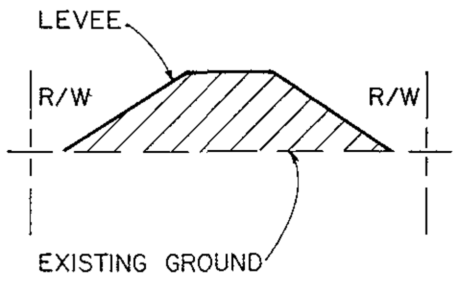
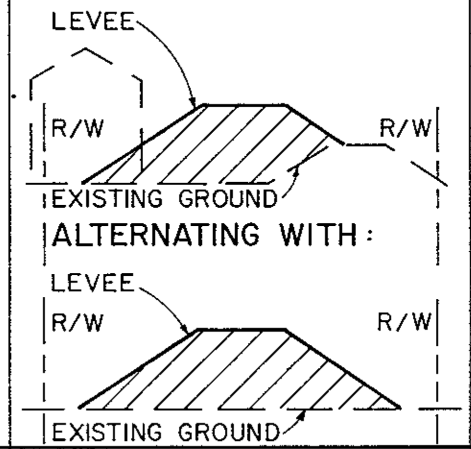
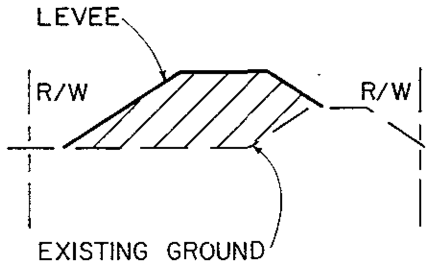
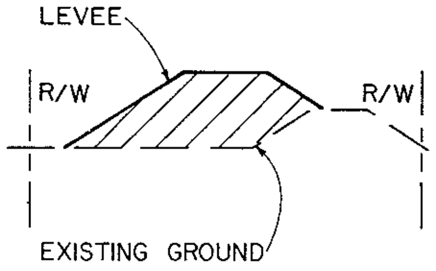
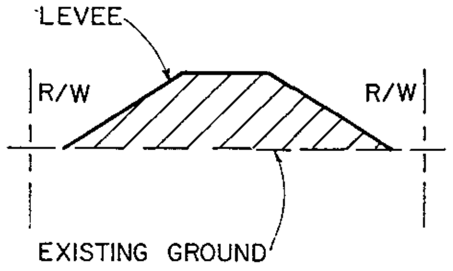
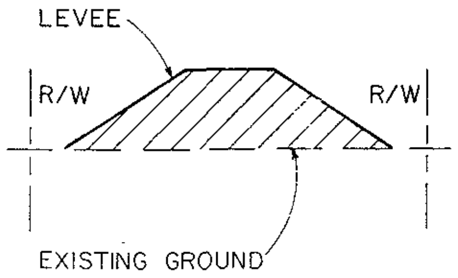
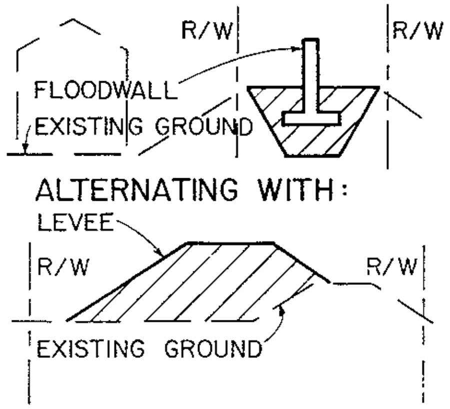
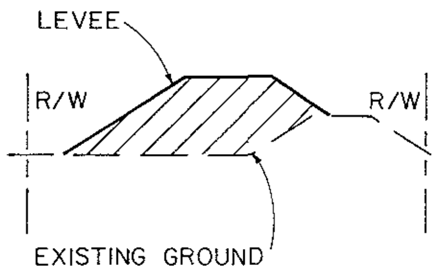
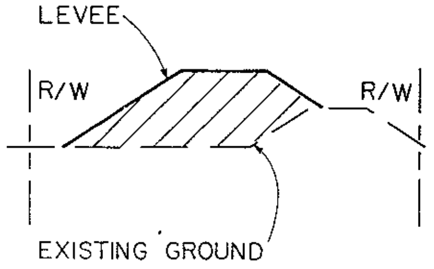
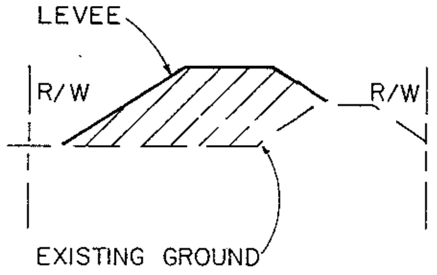
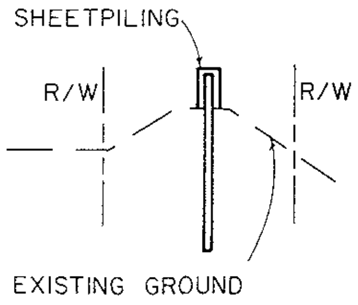
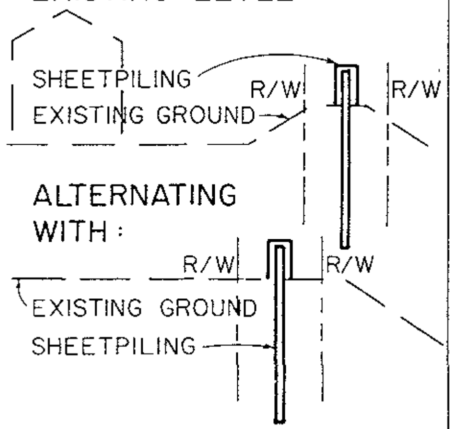
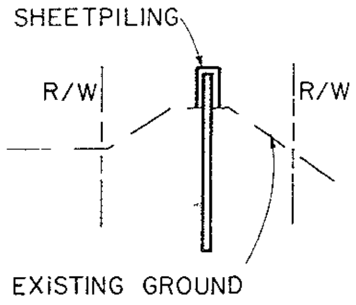
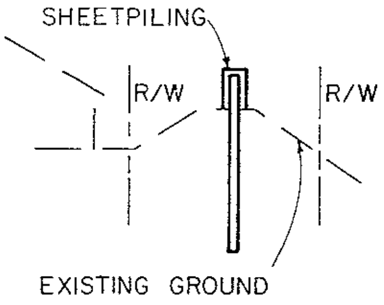
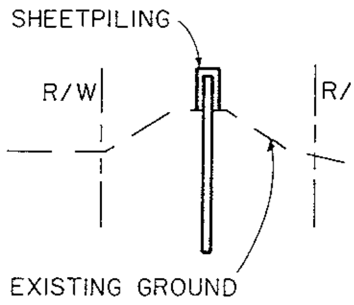
## (SECTIONS LOOKING UPSTREAM)

| REACH: 1<br>MARINA PARKING TO MILL ST. | 2<br>MILL ST. TO 250' DOWNSTREAM OF CATHERINE ST. | 3<br>250' DOWNSTREAM OF CATHERINE ST. TO CATHERINE ST. | 4<br>CATHERINE ST. TO TAYLOR ST. | 5<br>TAYLOR ST. TO S.P.R.R. | COST SUMMARY | FEATURE SUMMARY<br>O ADVANTAGES<br>OO DISADVANTAGES |
|---|---|---|---|---|---|---|
| (SAME AS B)<br>NEW LEVEE CUTTING ACROSS PENINSULA<br><br> | (SAME AS A)<br>BUILD FLOODWALL ON TOP OF EXISTING LEVEE<br>ALTERNATING WITH:<br><br> R/W<br>R/W<br>FLOODWALL<br>EXISTING GROUND<br>R/W<br>R/W<br>FLOODWALL<br>EXISTING GROUND | (SAME AS A)<br>RAISE EXISTING LEVEE<br><br> | (SAME AS A-I)<br>RAISE EXISTING LEVEE & RELOCATE YACHT CLUB & HOPE STREET<br><br> | (SAME AS A)<br>RAISE EXISTING LEVEE<br><br> | CONSTRUCTION COST $ 779,000<br>RIGHT-OF-WAY COST 147,000<br>ENGINEERING AND ADMINISTRATION COST 141,000<br>TOTAL $1,067,000 | B-1<br>O SECOND LOWEST COST<br>O LEAVES PENINSULA IN WILDLIFE REFUGE OPEN TO WATER<br>OO LEAVES PENINSULA WITHIN LIMITS OF ONE PERCENT FLOOD<br>OO POSSIBLE DAMAGE TO FRESHWATER MARSH SOUTH OF TAYLOR STREET<br>O ALLOWS HISTORIC BUILDINGS TO REMAIN<br>O FULL LENGTH VEHICULAR ACCESS |
| (SAME AS A)<br>RAISE EXISTING LEVEE<br><br> | RAISE EXISTING LEVEE<br>ALTERNATING WITH:<br><br> LEVEE<br>R/W<br>R/W<br>EXISTING GROUND<br>LEVEE<br>R/W<br>R/W<br>EXISTING GROUND | (SAME AS A)<br>RAISE EXISTING LEVEE<br><br> | (SAME AS A)<br>BUILD RETAINING WALL IN EXISTING LEVEE<br><br> | (SAME AS A)<br>RAISE EXISTING LEVEE<br><br> | CONSTRUCTION COST $1,146,100<br>RIGHT-OF-WAY COST 277,000<br>ENGINEERING AND ADMINISTRATION COST 205,900<br>TOTAL $1,629,000 | C<br>OO HIGH AMOUNT OF LAND REQUIRED<br>OO VISUALLY BLOCKS OFF WILDLIFE REFUGE PENINSULA FROM WATER<br>OO COVERS LARGE AREA OF PENINSULA WITH FILL<br>O PROTECTS WILDLIFE REFUGE PENINSULA FROM ONE PERCENT FLOOD<br>OO POSSIBLE DAMAGE TO FRESHWATER MARSH SOUTH OF TAYLOR STREET<br>OO REMOVES AND/OR DISTURBS HISTORIC BUILDINGS<br>OO DOES NOT PERMIT FULL LENGTH VEHICULAR ACCESS |
| (SAME AS A)<br>RAISE EXISTING LEVEE<br><br> | (SAME AS C)<br>RAISE EXISTING LEVEE<br>ALTERNATING WITH:<br><br> LEVEE<br>R/W<br>R/W<br>EXISTING GROUND<br>LEVEE<br>R/W<br>R/W<br>EXISTING GROUND | (SAME AS A)<br>RAISE EXISTING LEVEE<br><br> | (SAME AS A-I)<br>RAISE EXISTING LEVEE & RELOCATE YACHT CLUB & HOPE STREET<br><br> | (SAME AS A)<br>RAISE EXISTING LEVEE<br><br> | CONSTRUCTION COST $ 316,500<br>RIGHT-OF-WAY COST 307,000<br>ENGINEERING AND ADMINISTRATION COST 146,500<br>TOTAL $1,270,000 | C-1<br>OO HIGHEST AMOUNT OF LAND REQUIRED<br>OO VISUALLY BLOCKS OFF WILDLIFE REFUGE PENINSULA FROM WATER<br>OO COVERS LARGE AREA OF PENINSULA WITH FILL<br>O PROTECTS WILDLIFE REFUGE PENINSULA FROM ONE PERCENT FLOOD<br>OO POSSIBLE DAMAGE TO FRESHWATER MARSH SOUTH OF TAYLOR STREET<br>OO REMOVES AND/OR DISTURBS HISTORIC BUILDINGS<br>O FULL LENGTH VEHICULAR ACCESS |

# TYPICAL CROSS SECTIONS FOR ALTERNATIVES

## FIGURE 4

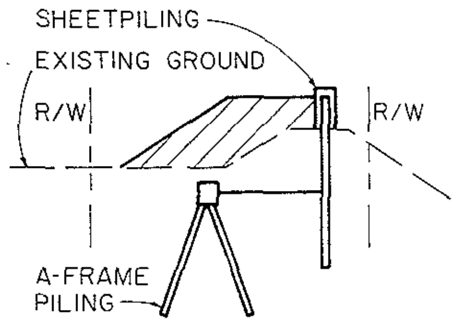
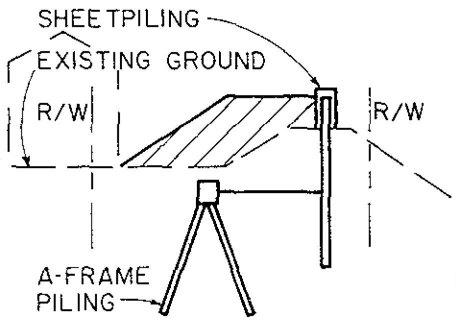
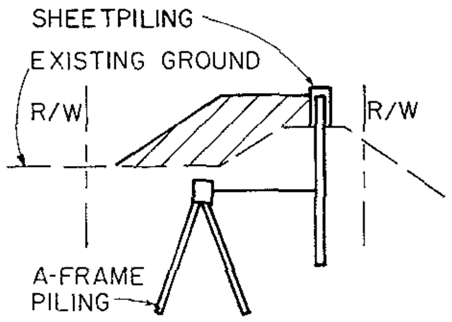
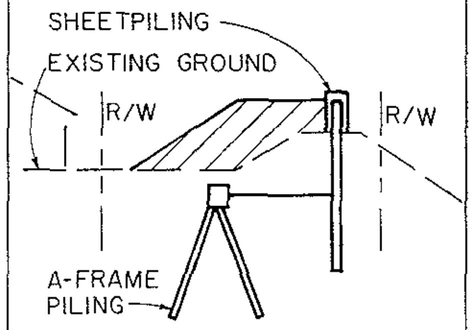
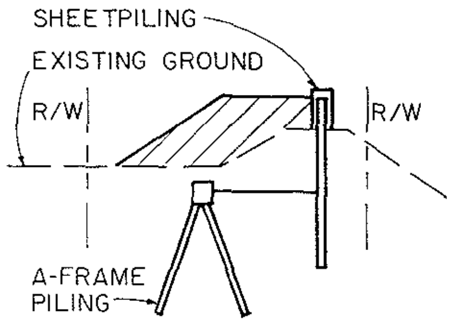
(SECTIONS LOOKING UPSTREAM)

| REACH: 1 | 2 | 3 | 4 | 5 | | |
|---|---|---|---|---|---|---|
| MARINA PARKING TO MILL ST. | MILL ST. TO 250' DOWNSTREAM OF CATHERINE ST. | 250' DOWNSTREAM OF CATHERINE ST. TO CATHERINE ST. | CATHERINE ST. TO TAYLOR ST. | TAYLOR ST. TO S.P.R.R. | COST SUMMARY | FEATUE SUMMARY<br>O ADVANTAGES<br>OO DISADVANTAGES |
| (SAME AS B)<br>NEW LEVEE CUTTING ACROSS PENINSULA<br> | (SAME AS C)<br>RAISE EXISTING LEVEE<br> LEVEE<br>R/W<br>R/W<br>EXISTING GROUND<br>ALTERNATING WITH:<br>LEVEE<br>R/W<br>R/W<br>EXISTING GROUND | (SAME AS A)<br>RAISE EXISTING LEVEE<br> | (SAME AS A-1)<br>RAISE EXISTING LEVEE & RELOCATE YACHT CLUB & HOPE STREET<br> | NEW LEVEE ALONG S.P.R.R.<br> | CONSTRUCTION COST $ 860,100<br>RIGHT-OF-WAY COST 230,000<br>ENGINEERING AND ADMINISTRATION COST 154,900<br>TOTAL $1,245,000 | D<br>O LEAVES PENINSULA IN WILDLIFE REFUGE OPEN TO WATER<br>OO LEAVES PENINSULA WITHIN LIMITS OF ONE PERCENT FLOOD<br>O MINIMIZES DAMAGE TO FRESHWATER MARSH SOUTH OF TAYLOR STREET<br>OO REMOVES AND/OR DISTURBS HISTORIC BUILDINGS<br>O FULL LENGTH VEHICULAR ACCESS |
| (SAME AS B)<br>NEW LEVEE CUTTING ACROSS PENINSULA<br> | BUILD FLOODWALL ON TOP OF EXISTING LEVEE<br> R/W<br>R/W<br>FLOODWALL<br>EXISTING GROUND<br>ALTERNATING WITH:<br>LEVEE<br>R/W<br>R/W<br>EXISTING GROUND | (SAME AS A)<br>RAISE EXISTING LEVEE<br> | (SAME AS A-1)<br>RAISE EXISTING LEVEE & RELOCATE YACHT CLUB & HOPE STREET<br> | (SAME AS A)<br>RAISE EXISTING LEVEE<br> | CONSTRUCTION COST $ 752,900<br>RIGHT-OF-WAY COST 152,000<br>ENGINEERING AND ADMINISTRATION COST 136,100<br>TOTAL $1,041,000 | D-1<br>O LEAST ENVIRONMENTAL IMPACT<br>O LEAST COST<br>O LEAVES PENINSULA IN WILDLIFE REFUGE OPEN TO WATER<br>OO LEAVES PENINSULA WITHIN LIMITS OF ONE PERCENT FLOOD<br>OO POSSIBLE DAMAGE TO FRESHWATER MARSH SOUTH OF TAYLOR ST.<br>O ALLOWS HISTORIC BUILDINGS TO REMAIN<br>O FULL LENGTH VEHICULAR ACCESS |
| BUILD SHEETPILING IN EXISTING LEVEE<br> | BUILD SHEETPILING IN EXISTING LEVEE<br> SHEETPILING<br>R/W<br>R/W<br>EXISTING GROUND<br>ALTERNATING WITH:<br>R/W<br>R/W<br>EXISTING GROUND<br>SHEETPILING | BUILD SHEETPILING IN EXISTING LEVEE<br> | BUILD SHEETPILING IN EXISTING LEVEE<br> | BUILD SHEETPILING IN EXISTING LEVEE<br> | CONSTRUCTION COST $1,840,100<br>RIGHT-OF-WAY COST 80,000<br>ENGINEERING AND ADMINISTRATION COST 330,900<br>TOTAL $2,251,000 | E<br>OO SECOND HIGHEST COST<br>O LEAST LAND AREA REQUIRED<br>OO VISUALLY BLOCKS OFF WILDLIFE REFUGE PENINSULA FROM WATER<br>O PROTECTS WILDLIFE REFUGE PENINSULA FROM ONE PERCENT FLOOD<br>O NO IMPACT ON FRESHWATER MARSH SOUTH OF TAYLOR STREET<br>O ALLOWS HISTORIC BUILDINGS TO REMAIN<br>OO POSSIBLE DAMAGE TO HISTORIC BUILDINGS DURING PILEDRIVING<br>OO DOES NOT PERMIT FULL LENGTH VEHICULAR ACCESS<br>OO REQUIRES STAIRS OVER FLOODWALL |

# TYPICAL CROSS SECTIONS FOR ALTERNATIVES

FIGURE 4

## (SECTIONS LOOKING UPSTREAM)

| REACH: 1 | 2 | 3 | 4 | 5 | | |
|---|---|---|---|---|---|---|
| MARINA PARKING TO MILL ST. | MILL ST. TO 250' DOWNSTREAM OF CATHERINE ST. | 250' DOWNSTREAM OF CATHERINE ST. TO CATHERINE ST. | CATHERINE ST. TO TAYLOR ST. | TAYLOR ST. TO S.P.R.R. | COST SUMMARY | FEATURE SUMMARY<br>O ADVANTAGES<br>OO DISADVANTAGES |
| FULL DREDGEABLE SHEETPILING ALONG EXISTING LEVEE<br> SHEETPILING<br>EXISTING GROUND<br>R/W<br>R/W<br>A-FRAME PILING | FULL DREDGEABLE SHEETPILING ALONG EXISTING LEVEE<br> SHEETPILING<br>EXISTING GROUND<br>R/W<br>R/W<br>A-FRAME PILING | FULL DREDGEABLE SHEETPILING ALONG EXISTING LEVEE<br> SHEETPILING<br>EXISTING GROUND<br>R/W<br>R/W<br>A-FRAME PILING | FULL DREDGEABLE SHEETPILING ALONG EXISTING LEVEE<br> SHEETPILING<br>EXISTING GROUND<br>R/W<br>R/W<br>A-FRAME PILING | FULL DREDGEABLE SHEETPILING ALONG EXISTING LEVEE<br> SHEETPILING<br>EXISTING GROUND<br>R/W<br>R/W<br>A-FRAME PILING | CONSTRUCTION COST $5,449,100<br>RIGHT-OF-WAY COST 242,000<br>ENGINEERING AND ADMINISTRATION COST 980,900<br>TOTAL $6,672,000 | F<br>O PERMITS FUTURE FULL LENGTH DREDGING DOWN TO EL. - 6<br>OO POSSIBLE FUTURE DAMAGE TO TIDAL ZONE BY DREDGING REQUIRES E.I.R.<br>OO HIGHEST COST<br>OO VISUALLY BLOCKS OFF WILDLIFE REFUGE PENINSULA FROM WATER<br>O PROTECTS WILDLIFE REFUGE PENINSULA FROM ONE PERCENT FLOOD<br>OO POSSIBLE DAMAGE TO FRESHWATER MARSH SOUTH OF TAYLOR STREET<br>O ALLOWS HISTORIC BUILDINGS TO REMAIN<br>OO POSSIBLE DAMAGE TO HISTORIC BUILDINGS DURING PILEDRIVING<br>O FULL LENGTH VEHICULAR ACCESS |
| | | | | | | |
| | | | | | | |

sheetpile bulkhead specifically designed to allow future dredging of the channel down to elevation -6.

Since any alternative for one reach can be combined with almost any alternative for another, the following discussion is arranged by reach.

## Reach 1 (County Marina to Mill Street) Alternatives

Refering to Figure 4, in Reach 1 Alternatives A, A1, C, and C1 consist of raising the existing levee and widening it to a minimum 18 foot width. As recommended by Appendix B, the Geotechnical Report, the existing embankment must first be excavated down to sounder material. In addition, the new embankment must be set back some 10 feet from the top of the existing slope. This requires a strip of land from 50 to 60 feet wide from the marina parking lot around the point to Mill Street. This appreciably reduces the land area available to Fish and Wildlife. Behind the existing concrete building there is not enough space for raising the existing levee by embankment alone, without encroaching on the building. Alternatives A, A1, C, and C1 include, therefore, a 95 foot long reinforced concrete floodwall for this area.

As an alternative to raising the existing levee around the exterior of the Wildlife Refuge property, Alternatives B, B1, D, and D1 provide a "cutoff levee". The alignment of the cutoff levee follows the existing levee from the marina parking lot to the sharp bend 150 feet south. From that point a new levee having an 18 foot minimum width heads directly to the west end of Mill Street. There a ramp is provided to allow vehicular access from the top of the new levee down onto the top of the existing levee on the outboard side. This alignment leaves the existing previously mentioned concrete building outside the area protected from the one percent flood. On the other hand, a much larger portion of the peninsula will remain usable due to not having a 50 to 60 foot wide strip along its periphery occupied by levee. With a cutoff levee, this area could be made into a salt marsh in the future.

For Alternative E, steel or prestressed concrete sheetpiling is driven into the existing levee with sheetpiling left exposed up to the same elevation as the tops of the Alternative A, A1, C and C1 levees. A concrete cap wall is cast around the exposed portion of the steel sheetpiling. Embankment could be placed on both sides of the sheetpiling to reduce its exposed height to that of a low wall, say three feet. Stairways over the wall are installed at 200 foot centers. For Alternative E there is no vehicular access on the river side of the wall.

For Alternative F, steel sheetpiling is driven into the existing levee with sheetpiling left exposed up to the same elevation as the tops of the Alternative A, A1, C, and C1 levees. A concrete cap tops off the sheetpiling. Twenty-two to forty feet inland of the sheetpiling, a row of steel or timber batter piles is driven. Steel rods attach the tops of the batter piles to a waler at the sheetpiling. An embankment having a minimum 18 foot crest width is then built even with the top of the sheetpiling, immediately inland from it. A curb and railing are provided along the sheetpiling. The resulting sheetpiling bulkhead provides the necessary flood protection and vehicular access. In addition, this arrangement allows the portion of the channel next to the bulkhead to be dredged down to elevation -6 NGVD at some later date.

In Reach 1 portions of Alternatives A, A1, C, C1, E, and F face the reach of Guadalupe River immediately downstream of the marina entrance. Prevailing winds frequently blow waves against this section of levee. Therefore, levees in Alternatives A, A1, C, C1, and E have 300 feet of riprap slope protection in this reach. In Alternative F, the sheetpiling provides its own slope protection.

## Reach 2 (Mill Street to 250 feet downstream of Catherine Street) Alternatives

In Reach 2 Alternatives A, A1, B, and B1 consist of constructing a reinforced concrete floodwall. Some 300 feet of the alignment through this reach pass through the site of the former historic cannery buildings. Due to subsidence, the concrete floor slabs of these old structures are now at or below Elevation 0, buried under eight to ten feet of heterogeneous, poorly compacted fill. The contact between this fill and the old floor slab is a possible seepage route. As recommended by the Geotechnical Report, the existing site material over these slabs is excavated down to the existing slabs and replaced with properly compacted, suitable imported material. Similar replacement of poorly compacted site material is recommended for the rest of Reach 2. The entire floodwall is then built on an acceptable foundation. Embankment could be placed on both sides of the floodwall to reduce its exposed height to, say, three feet. The Reach 1 levee ramps down on the river side of the floodwall to provide vehicular access.

Alternatives C, C1, and D consist of raising and strengthening the existing levee. Accomplishing this requires removal of portions of the still standing cannery buildings and demolition and removal of the former Union Warehouse (also referred to as the former Ice-House). On the river side, the toe of the new embankment is a minimum of 5 feet landward from the existing top of slope to not overload the existing bank. The crest of the new levee is a minimum of 18 feet wide for vehicular access. A toe drain should be installed at the landward toe of the existing embankment from Elizabeth Street to the south end of the reach. The toe drain should be connected to a drainage ditch or storm sewer pipe.

Alternative D1 combines levee raising with a retaining wall at the corner of the cannery building near Mill Street and a floodwall past the Union Warehouse. The retaining wall eliminates removing a portion of the cannery or placing a buttress fill inside it and the floodwall eliminates removing the Union Warehouse.

Alternatives E and F are the same in Reach 2 as in Reach 1. However, the buried concrete floor slabs of the former cannery building present difficulties for driving sheetpiling, especially concrete sheetpiling. A trench must be dug before driving and the old floor slabs broken up and removed. It is possible that pile (and sheetpile) driving vibrations could shake down cannery buildings or the Union Warehouse.

## Reach 3 (250 feet downstream of Catherine Street to Catherine Street) Alternatives

In Reach 3, all alternatives except E and F consist of raising the existing levee. On the river side the toe of the new slope is set back a minimum of 5 feet from the existing top of slope. The raised levee has a minimum 18 foot top width. A continuous toe drain is placed along the bottom of the landward face of the existing levee. As in previous reaches, Alternative E is a sheetpile floodwall and Alternative F is a sheetpile bulkhead. The one anticipated sheetpile and pile driving problem area in this reach is at the abandoned petroleum product pipes discussed in the following paragraph.

All alternatives in this reach must contend with a set of buried and abandoned petroleum product pipelines which ran from a small pier in the river to a tank farm on the east side of Hope Street. Both pier and tank farm are gone but the pipes are understood to remain. Their sizes and number are unknown. Abandoned pipelines through levees often represent seepage paths. As part of any alternative these pipes should be located, a section removed from each, and both sections of each pipe plugged with mortar. A concrete cutoff wall should be built across the ends of the pipes leading to the river.

All Reach 3 alternatives maintain access to the existing public dock at the end of Catherine Street. For Alternatives A through D1 the crest of the levee swings away from the river to allow a ramp to extend southwesterly from

Hope Street near the Union Warehouse up and over the levee and then down to the top of the bulkhead. For Alternative E the top of the sheetpiling drops as necessary to pass under a similar ramp and a short section of embankment similar to Alternatives A through D1 provides the flood protection. For Alternative F, the existing public dock's bulkhead is removed and the new sheetpile bulkhead itself provides the face of a new marginal wharf.

## Reach 4 (Catherine Street to Taylor Street) Alternatives

For Reach 4 Alternatives A, B, and C consist of removing part of the existing levee and building a reinforced concrete retaining wall. The soil conditions described in the Geotechnical Report effectively preclude use of spread footings for this wall. A number of alternatives were studied including reinforced earth, reinforced concrete wall panels between soldier piles, and large drilled concrete piers extending almost to the top of the wall. The most economical section was found to be a cantilever retaining wall supported by drilled piers. The retaining wall allows widening Hope Street past the South Bay Yacht Club (SBYC) from its present minimum of 15.5 feet at the corner of Taylor Street. The space available between the wall and the top of the river bank would be as little as six feet so vehicular travel would not be possible along the top of the raised and strengthened levee in part of Reach 4.

Alternatives A1, B1, C1, D, and D1 consist of relocating the SBYC clubhouse and Hope Street, and raising the existing levee. The SBYC clubhouse presently occupies a 100 foot by 135 foot parcel owned by the Club at Hope and Taylor Streets. The Club also owns a 150 foot by 135 foot parcel at Hope and Catherine. The two parcels owned by the Club are separated by only a 30 foot wide unimproved alley right-of-way. For these alternatives the clubhouse is moved to the Hope and Catherine parcel. Hope Street is then relocated from Catherine Street to Taylor Street, starting at the Hope-Catherine intersection and running on a diagonal to a point on Taylor Street 140 feet east of its present intersection with Hope Street. Adequate replacement streets will be provided. A City water main, a City sanitary sewer, and a P.G.&E. gas main must be relocated. The crest of the raised and strengthened levee is a minimum of 18 feet wide. A continuous toe drain is placed along the bottom of the landward face of the existing levee. Two concrete stairs with steel handrails extend from the edge of the relocated street to the top of the raised levee. Concrete stairs run down the river side of the raised levee to the two existing floats.

The clubhouse is of frame construction and is founded on heavy timber mudsills. There is a two to three foot high crawl-space under the building which is drained by a sump pump under the north end of the front porch. The clubhouse has been inspected by several professional house-movers, all of whom consider it definitely movable. Representatives of the Club have stated that the Club is agreeable to negotiating conditions for moving the clubhouse to make way for raising and strengthening the levee. Estimated costs for relocating the clubhouse include disconnecting utilities, moving the building, regrading the present site, providing a new foundation, reconnecting utilities, a new gravel surfaced parking lot, and purchase from the Club of the land needed for the levee work and street relocation.

As before, Alternative E is a sheetpile floodwall and Alternative F a sheetpile bulkhead. Alternative E does not move the SBYC clubhouse and leaves room for pedestrian access only. Alternative F moves the clubhouse and allows full length vehicular access. Construction difficulties are expected for both past the SBYC due to previous construction now buried in the existing levee. This includes old pier pilings, an old timber crib-wall possibly containing large stones, and a 550 gallon galvanized steel gasoline storage tank buried in the top of the levee opposite the driveway between the Clubhouse and the old boatshed to its north. A steel pipe connects the tank to a pump on a wooden platform to the south. From the pump a pipeline and hose run out onto the southerly of the two floats. The tank is filled through a hose from a truck parked on Hope Street.

## Reach 5 (Taylor Street to SPRR) Alternatives

For Reach 5 Alternatives A through C1 and D1 (A, A1, B, B1, C, C1, and D1) consist of raising the existing levee. An access ramp is provided at Taylor Street and a turnaround is provided near the south end of the project at the SPRR bridge. The raised levee's crest width is a minimum of 18 feet.

Alternative D is a new levee running southeasterly from the Hope and Taylor intersection almost to the SPRR embankment which occupies the western portion of the City of San Jose Eldorado Street right-of-way. The new levee would then parallel the west edge of the SPRR embankment to the south end of the project. An access ramp is provided at Taylor Street and a turnaround is provided near the south end. The levee crest width is a minimum of 18 feet. This alignment allows more open space between the levee and the tidal zone.

As with all other reaches, Alternative E is a sheetpile floodwall along the existing levee. The existing Reach 5 levee is widened as necessary to provide a minimum 18 foot top width three feet below the top of the wall. This 18 foot width is divided into a 6 foot pedestrian-only strip on the river side of the floodwall and a 12 foot minimum vehicular access strip on the land side. Periodic stairs allow pedestrian access over the wall.

Due to the deep bay mud deposits in Reach 5, the Alternative F sheetpile bulkhead is expected to display appreciable differential settlement and lateral movement over the years. An access ramp is provided at Taylor Street as is a turnaround near the south end.

## Comparison of Alternatives

Figure 4 shows comparative information for the alternatives including costs for construction, rights-of-way, and engineering and administration; along with key advantages and disadvantages. Costs by reach and type of solution are presented in Appendix D, Cost Summary of Alternatives. Environmental considerations are discussed in the Draft Negative Declaration and Initial Environmental Statement.

It is readily apparent that Alternatives E (sheetpile floodwall) and F (sheetpile bulkhead) are far more costly than the other eight alternatives. Alternative E allows a lower level of access along the top of the levee in all reaches. Alternative F has the advantage of allowing any future channel dredging to have a vertical face along the east bank.

Alternatives A, B, and C are more costly to build than Alternatives A1, B1, C1, D and D1 because of the expensive retaining wall in Reach 4 near the South Bay Yacht Club. This wall would limit levee access past the Yacht Club to pedestrians only. Alternatives B, B1, D and D1 have cost advantages due to their Reach 1 alignment which cuts across the Fish and Wildlife property peninsula.

In Reach 5, the more landward levee of Alternative D is more costly than Alternatives A through C1 and D1 since it is longer and involves greater heights of fill.

Since Alternative D1 is the least costly environmentally acceptable solution (see Initial Environmental Study), it is the recommended Alternative.

# PROPOSED PROJECT

The proposed project is Alternative D1. It is shown on Plates 1 through 6 at the end of this report. It is selected on the bases of minimum environmental impact, least cost, full length vehicular and pedestrian access, and accommodation of possible future differential settlement. While this section gives more details than the previous section, the other alternatives were studied in comparable detail.

## Reach 1 (County Marina to Mill Street) Description

The existing levee is raised and widened from the south edge of the marina parking lot to the sharp bend 150 feet to the south. Then a new levee cuts across the peninsula to the end of Mill Street. The Geotechnical Report estimates an ultimate levee settlement in this area of from 14 to 17 inches over a 3 to 5 year period. Therefore, the top of the embankment is to be built 4.5 feet above the one percent water level. This allows 18 inches of settlement before encroaching on the three foot FIA freeboard. The 18 foot minimum top width permits vehicles to pass. Side slopes are 2 to 1 (horizontal to vertical).

For the raised levee section, a key is dug into the top of the existing levee starting at its outboard (river side) top of slope. From there the excavated surface drops at a 1 to 1 slope to a depth of 3 feet and then levels off. A key trench is excavated for the toe of the inboard (land side) slope. It is 8 feet wide and 3 feet deep. Other surfaces to be covered by embankment are stripped of loose rubble and organic material. The entire area is then moisture conditioned and compacted by "track walking". Finally, the embankment is placed and compacted to 90 percent. The embankment is wide enough to include a 5 foot bench level with the top of the existing levee on the outboard side. Construction of the new levee cutting across the peninsula is similar except that there are key trenches under the toes of both the outboard and inboard slopes, and both slopes rise directly to the 18 foot minimum width crest without any bench. Access to the north end of the top of the levee is directly from the marina parking lot. At the south end there is access by a ramp from the top of the new levee down to the top of the existing levee on the outboard side. This allows access to the portion of the Fish and Wildlife Property outboard of the new levee.

## Reach 2 (Mill Street to 250 feet downstream of Catherine Street) Description

Reach 2 features a new levee, a raised and widened levee, and a floodwall. The Geotechnical Report anticipates only one or two inches of settlement in this reach so special measures against settlement are not required.

The new levee extends from Mill Street past the still standing cannery buildings to a point 150 feet downstream of Elizabeth Street. (See Plates 3 and 4). It has an 18 foot minimum crest width, 2 to 1 side slopes, and key trenches under the toes of both slopes. A retaining wall protects the northwest corner of the building shell containing the water tower from levee soil loads. Beyond the still standing cannery buildings the existing levee is raised and widened. Its inboard slope extends down to the floor of one of the now razed portions of the cannery. The portion of the floor upon which embankment is to be placed is first removed and the underlying soil compacted.

The north end of the reinforced concrete floodwall is buried in the end of the raised and widened levee at Elizabeth Street. It extends to a point south of the Union Warehouse where its south end is buried in the end of the Reach 3 raised and widened levee. A 12 foot minimum width space at the same elevation as the top of the existing levee is provided along the river side of the wall for vehicular access. Earth ramps along the river side of the floodwall at each end provide access from the tops of the adjoining raised levees.

Costs of the floodwall are based on a spread footing cantilever wall founded on imported material placed in an overexcavated trench. For final design alternative types of wall will be considered including cantilever wall on drilled piers and reinforced earth.

## Reach 3 (250 feet downstream of Catherine Street to Catherine Street) Description

The existing levee is raised and widened the full length of the reach. The Geotechnical Report estimates an ultimate levee settlement in this area of from 10 to 12 inches within 3 to 5 years so the top of the embankment is to be built 4 feet above the one percent water level. This allows 12 inches of settlement before encroaching on the three foot FIA freeboard. The 18 foot minimum top width permits vehicles to pass. Side slopes are 2 to 1. As at the start of Reach 1, a key is dug into the top of the existing levee for the raised levee's outboard toe; and a key trench excavated for the inboard toe.

A 5 foot minimum width bench is left between the outboard toe and the top of the existing slope. A toe drain is built against the inboard toe of the existing levee to intercept seepage.

Access to the top of the raised levee and the public dock at the end of Catherine Street is provided by a ramp. It starts on the west side of Hope Street in front of the Union Warehouse and climbs, running southwesterly, to the top of the raised levee on a 10 percent grade. As shown on Plate 4, the top of the raised levee has a reverse bend at this point allowing the ramp to cross it at right angles. The ramp, still running southwesterly, then drops to the top of the existing dock at 10 percent. The ramp is a minimum of 24 feet wide to accommodate wide loads.

The abandoned petroleum pipelines through the existing levee must be located and properly treated so they cannot be a future (or present) seepage path. The pipelines should be located, a section cut out of each, and both sections of each pipe plugged with mortar. A concrete cutoff should then be built across the ends of the pipes.

The existing small stormwater pumping station at the northwest corner of Hope and Catherine Streets will probably have to be reconstructed. Its outfall to the river will have to be rebuilt where it passes through the levee.

## Reach 4 (Catherine Street to Taylor Street) Description

The existing levee is raised and widened the full length of the reach in the same manner as for Reach 3. Again the top of embankment is built 4 feet above the one percent water level to allow for 12 inches of settlement plus 3 feet of freeboard. The top width is a minimum of 18 feet and side slopes are 2 to 1. There is a key into the top of the existing levee and a key trench under the inboard toe. A 5 foot minimum width bench is left between the outboard toe and the top of the existing slope. A toe drain is built against the inboard toe of the existing levee to intercept seepage. Vehicular access to the top of the levee is from the Reach 3 and 5 levee crests. Pedestrian access to the levee crest from Hope Street is by two concrete stairways built against the new slope. Another two concrete stairways lead down from the crest to the two South Bay Yacht Club floats.

Approximately 300 feet of the Hope Street roadway is relocated next to the toe of the raised and widened levee. Buried utilities to be relocated include water, natural gas, and storm and sanitary sewer. The South Bay Yacht Club clubhouse is relocated to the Club-owned parcel at the southeast corner of

Hope and Catherine Streets. Relocation includes a gravel surfaced parking area and utility connections.

## Reach 5 (Taylor Street to SPRR) Description

The existing levee is raised and widened the full length of the reach in the same manner as in Reaches 3 and 4. From a point 200 feet south of Taylor Street almost to SPRR the Geotechnical Report estimates an ultimate settlement of from 15 to 20 inches. Half of this settlement is anticipated to occur within 4 to 7 years and the balance within 15 to 20 years. Two stages of construction are recommended. The top of the raised and widened embankment is initially built a minimum of 22 feet wide and 4 feet above the one percent water level. This allows up to 12 inches of settlement before encroaching on the 3 foot freeboard. Once the first 12 inches of settlement have taken place (in 4 to 7 years), the levee can be raised another 12 inches to accomodate the rest of the ultimate settlement. This will narrow the crest by 4 feet to the final minimum width of 18 feet. This raising would cost $10,000 at mid-1983 price levels.

An access ramp extends up southeasterly from Taylor Street to the top of the levee. Turnarounds are provided at the top of this ramp and at the south end of the project. The most southerly end of the levee is an additional foot higher to meet the special FIA freeboard requirement within 100 feet of a bridge.

## Project Cost

Costs for the proposed project, Alternative D1, are listed below. The basis for cost estimating is given under that heading in the section entitled ALTERNATIVE FORMULATION. A more detailed estimate is included in Appendix D, Cost Summary of Alternatives.

| | |
|---|---|
| Construction Cost | $ 752,900 |
| Engineering, Administration, and Overhead Costs | 136,100 |
| Right-of-Way Acquisition Cost | 152,000 |
| Total | $1,041,000 |

## Effects on West Bank of River

Table 5 compares volumes of one percent flood overflows across the Guadalupe River west bank with and without the project. These values were developed as part of the iterative backwater and overflow weir process described under "Design Flood" in the DESCRIPTION OF THE PROBLEM section of this report. The significance of the three flow conditions is discussed under that heading. Conservative roughness factors were used in these calculations resulting in conservatively high estimated overflow volumes.

TABLE 5

ONE PERCENT WEST BANK FLOOD OVERFLOWS WITH AND WITHOUT PROJECT

| | Flow Condition | | |
|---|---|---|---|
| Condition | One Precent Discharge Bay at MHHW (Acre Feet) | Ten Percent Discharge Bay at HET (Acre Feet) | Ten Percent Discharg Bay at MHHW (Acre Feet) |
| With Project | 7,300 | 2,970 | 1,230 |
| Without Project | 6,500 | 2,900 | 1,230 |
| Increase | 800 | 70 | 0 |

As shown in Table 5, increases in west bank overflow volumes due to the project are negligible for flow conditions other than one of the two alternative one percent conditions; and then only once all contemplated upstream improvements have been made. Since the third flow condition represents ten percent flow conditions with or without any upstream improvements, increases in west bank overflow volumes are nil for any ten percent event.

## CONCLUSIONS AND RECOMMENDATIONS

The community of Alviso is subject to flooding from Guadalupe River, Coyote Creek, the Bay tides, and the watershed between the two streams. Past flooding has inundated the entire community to depths up to five feet.

The greatest flooding danger to Alviso is a sudden progressive failure of the existing Guadalupe River east levee. Such a failure would allow rapid entry of water into Alviso from both the river and San Francisco Bay.

Improving the Guadalupe River east levee at Alviso is the first step toward full protection of the community from fresh and saltwater flooding. Projects upstream on Guadalupe River and the proposed Alviso Ring Levee will complete protection for Alviso.

It is therefore recommended that the measures proposed in the preceding section of this report, PROPOSED PROJECT, be approved and construction plans be prepared for implementation of the project.

# NEGATIVE DECLARATION AND INITIAL ENVIRONMENTAL STUDY

Prepared by
The Planning Collaborative, Inc.
Supported by
Harvey & Stanley Associates, Inc., Ecological Consultants, and
Dr. Robert Cartier, Archeological Resource Management

# NEGATIVE DECLARATION

## Project

Guadalupe River flood control project.

## Location

Along the Guadalupe River adjacent to Alviso, from the County Marina to the Southern Pacific Railroad, City of San Jose.

## Purpose

The purpose of the proposed project is to protect the community of Alviso from freshwater or tidal flooding by the Guadalupe River. It will act, in conjunction with proposed projects upstream on the Guadalupe River and the ring levee around the north, east and south sides of Alviso (under study by the City), to protect the community from the one percent flood.

## Description of the Proposed Project

The flood control modifications consist of raising and strengthening the existing levee between the County Marina and the Southern Pacific Railroad in combination with construction of a new cutoff levee near the west end of Mill Street, construction of a retaining wall to protect one of the historic cannery buildings, a floodwall to protect the former Union Warehouse (Old Ice House) and relocation of the South Bay Yacht Club to allow for levee improvements. The proposed project is labeled Alternative D1 in the Engineer's Report and Initial Environmental Study.

## Findings

Based on an Initial Study pursuant to Section 15080 of State CEQA Guidelines, staff has determined that the proposed project would not have asubstantial (significant) adverse effect on the environment; consequently, a Negative Declaration is the appropriate finding.

## Basis of Findings

Most of the adverse impacts would result from temporary construction activities and are, therefore, considered minor. These include generation of dust and increased vehicular emissions, soil disruption and compaction, generation of noise, minor disruption of traffic at several intersections, and inhibited access to authorized boat moorings and the public dock at Catherine Street. In addition, several minor longer-term impacts would result. These include minor additional flood flow into the salt ponds to the west only during rare flood events, construction disturbance and filling a limited area of upland vegetation between the railroad and existing levee (not considered significant wildlife habitat), covering 0.8 acres of the Wildlife Refuge peninsula property, minor displacement of currently vacant private property and minor additions of impervious surface.

It should also be noted that, in addition to the stated flood control objective, the proposed project may offer several beneficial impacts. It will not provide additional flood protection to the Wildlife Refuge peninsula property (2.3 acres). However, land use decisions regarding this area have not yet been made. If the area is to be used for visitor-serving recreational facilities or as a site for future marsh restoration, then the proposed project enhances the opportunity for restoration and improves vistas to the salt marshes and Bay. If this area is to remain for storage and maintenance, then the proposed project offers relatively little change from the present conditions.

The proposed design will also allow users of the South Bay recreational trail closer access to the salt marsh by maintaining open pedestrian and vehicular access along the levees.

To mitigate the minor impacts noted above and ensure that any potential risks are minimized, the following measures will be implemented:

| Potential Impact | Recommended Mitigation Measures |
|---|---|
| Erosion Potential | Channel slope protection and reseeding as needed |
| Seismic Risks | Design new structures to suitable seismic design criteria |
| Particulates from Construction | Wet disturbed surfaces |
| Habitat Reduction | Avoid construction activity on the channel side of levees below Elevation 7 NGVD |
| Disrupt access to authorized boat moorings | Provide temporary ramps and stairways |
| Disruption of public dock at Catherine Street | Construct diagonal ramp up to top of levee to retain access |
| Interrupt roadway circulation | Maintain emergency vehicle access and permanent maintenance access |

| Potential Impact | Recommended Mitigation Measures |
|---|---|
| Risks to historic structures | Construct floodwall segments at the Cannery Complex and Old Union Warehouse to protect them |
| Blocking Intersection at Hope and Taylor Streets | Maintain adequate detour route during construction |

# INITIAL ENVIRONMENTAL STUDY

## SUMMARY OF FINDINGS

### Purpose

The purpose of this Initial Environmental Study is to identify and analyze the potential environmental impacts associated with proposed flood control alternatives for Guadalupe River at Alviso and compare the impacts of each alternative. The study approach is designed to meet several goals: to aid in the initial screening and selection of alternatives; to provide more detailed information on those impacts identified as relevant; and to recommend techniques and measures which can be incorporated into the design to mitigate or reduce possible impact.

### Description of Alternative Projects

The basic project involves providing protection from the one percent flood for the Alviso portion of Guadalupe River (from the Southern Pacific Railroad to the Santa Clara County Marina). The alternatives considered involve various levee alignments and combinations of flood walls, retaining walls, new levees, and raising and strengthening existing levees. Ten alternatives were considered. The following paragraphs describe the basic characteristics of each alternative and the primary purpose of each.

Alternatives A and A1. The purpose of this plan is to improve existing levees without impacting the historic structures in the National Register District. It involves raising and strengthening levees around the U. S. Wildlife Refuge property, use of reinforced concrete floodwalls instead of earth mounds along the reaches bordering historic structures, a retaining wall past the historic South Bay Yacht Club, and levee raising and strengthening for all other reaches. An option, Alternative A1, would reduce costs by relocating the yacht club to the northeast, relocating Hope Street, and raising and widening the existing levee in that reach rather than building a new retaining wall.

Alternatives B and B1. The intent of this plan is to reduce total levee length and reduce costs, and also maintain the existing barrier-free visual and recreational shoreline relationship between land and water. The features of Alternative B are identical to those of A except that a cutoff levee would be constructed across the refuge property instead of raising and strengthening the existing levees. As above, alternative B1 involves relocating the South Bay Yacht Club and Hope Street, and raising the existing levee in place of a retaining wall to save project costs.

Alternatives C and C1. This alternative would reduce project costs of floodwall construction by raising and strengthening existing levees except in the reach bordering the South Bay Yacht Club, where a retaining wall would be employed. Again, Alternative C1 would involve relocation of the yacht club and use of an improved levee rather than a retaining wall.

Alternative D. This alternative involves levees the entire length of the project. It includes the cutoff of the refuge property and relocation of the South Bay Yacht Club. In addition, the levee segment at the southern end of the project is realigned to the east to reduce impact on upland vegetation and leave a larger area on the channel side of the levee for some type of marsh restoration in the future by another agency.

Alternative D1. This alternative involves raising and strengthening levees for the entire project length with a retaining wall and a floodwall to protect historic structures, use of the shorter cut-off levee across the refuge property to reduce costs, and relocation of the yacht club and Hope Street.

Alternative E. The sheetpile floodwall alternative seeks to minimize right-of-way acquisition. It involves use of a continuous sheetpile wall driven into the existing levees for the entire project length. It follows the same alignment as Alternatives A, A1, C and C1.

Alternative F. The sheetpile bulkhead alternative satisfies project flood control objectives, while also providing the opportunity for future dredging of the river channel along the outboard edge to improve navigability and channel capacity. Following the Alternative E alignment, it involves use of a continuous tied-back sheetpile bulkhead wall for the entire project length and relocating the South Bay Yacht Club. The existing levee is raised to the top of the bulkhead wall. Sediment and earth material on the channel side of the wall could be dredged down to Elevation -6 NGVD at a later time.

## Comparison of Alternative Projects

Table 6 presents significant characteristics of the alternatives. Among the alternatives, there are a number of key environmental tradeoffs which must be considered in light of varying value choices (see Figure 5).

Alternative F may result in a significant impact to the patches of salt marsh habitat and bottom dwelling organisms in the channel if future dredging activity is conducted. At the very least, any consideration of future dredging will require further environmental review.

Alternatives C, C1, and D would result in direct disturbance or potential removal of two historic structures in the Bayside Cannery Complex, while Alternatives A, B, E and F (and A1, B1, and D1) would avoid these structures. However, vibrational impact or weakening of walls with additional lateral load could occur from any of the alternatives. None of the alternatives would impact the South Bay Yacht Club, but alternatives, A1, B1, C1, D1 and D would require relocating the club and Hope Street further inland. This is generally viewed as a beneficial impact on the yacht club, because the club is currently experiencing settlement problems and occasional ponded water.

Alternatives A, C, E and F (and A1 and C1) provide flood control benefits for the entire project area, while Alternatives B and D (and B1 and D1) leave part of the U. S. Wildlife Refuge property unprotected due to the cutoff levee. If this area (approximately 2.3 acres) were to be used for storing materials and maintenance equipment, then allowing the flood risk to continue could be a problem. However, if the area were to be used for visitor-serving recreational use (e.g., interpretive center), then the vistas to the salt marsh and bay which would remain open in the absence of raised levees would provide a recreational benefit.

Each of the alternatives will require acquisition of portions of the Wildlife Refuge peninsula property. Alternatives A, C, E and F (also A1 and C1), which follow the existing levees, will result in covering of approximately 1.8 acres of the refuge area. Alternatives B and D (also B1 and D1) will result in directly covering 0.8 acres. As mitigation, the U. S. Fish and Wildlife Service would be compensated for loss of property.

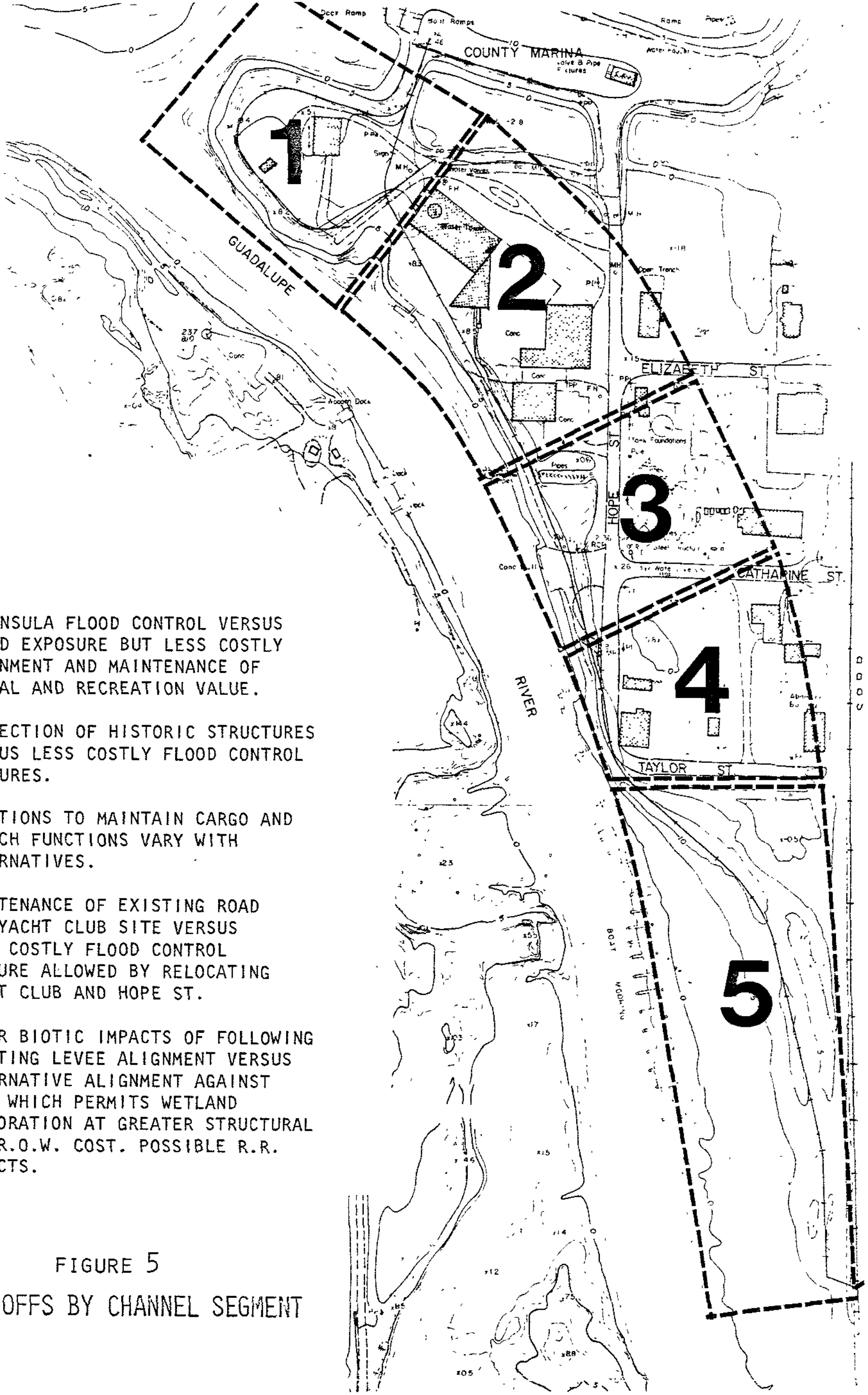
## TABLE 6

## CHARACTERISTICS OF ALTERNATIVES

| Alternative | Length, Feet |  |  |  | Width of Permanent Construction, Feet |  | Total Embankment Volume, CY |
|---|---|---|---|---|---|---|---|
|  | Levees | Floodwalls | Retaining Walls | Total | Min. | Max. |  |
| A | 2155 | 540 | 495 | 3190 | 25 | 70 | 37,000 |
| A1 | 2555 | 540 | 95 | 3190 | 25 | 110 | 44,000 |
| B | 1670 | 540 | 400 | 2610 | 25 | 120 | 31,000 |
| B1 | 2070 | 540 | 0 | 2610 | 25 | 110 | 38,000 |
| C | 2790 | 0 | 400 | 3190 | 25 | 110 | 39,000 |
| C1 | 3190 | 0 | 0 | 3190 | 35 | 110 | 46,000 |
| D | 2610 | 0 | 0 | 2610 | 25 | 120 | 40,000 |
| D1 | 2415 | 270 | 0 | 2685 | 25 | 120 | 53,000 |
| E | 0 | 0 | 3190* | 3190 | 25 | 25 | 6,700 |
| F | 0 | 0 | 3190** | 3190 | 30 | 120 | 37,000 |

* Sheetpiling driven into and extending above existing levees

** Dredgeable sheetpile bulkhead in existing levees



**1** PENINSULA FLOOD CONTROL VERSUS FLOOD EXPOSURE BUT LESS COSTLY ALIGNMENT AND MAINTENANCE OF VISUAL AND RECREATION VALUE.

**2** PROTECTION OF HISTORIC STRUCTURES VERSUS LESS COSTLY FLOOD CONTROL MEASURES.

**3** SOLUTIONS TO MAINTAIN CARGO AND LAUNCH FUNCTIONS VARY WITH ALTERNATIVES.

**4** MAINTENANCE OF EXISTING ROAD AND YACHT CLUB SITE VERSUS LESS COSTLY FLOOD CONTROL MEASURE ALLOWED BY RELOCATING YACHT CLUB AND HOPE ST.

**5** MINOR BIOTIC IMPACTS OF FOLLOWING EXISTING LEVEE ALIGNMENT VERSUS ALTERNATIVE ALIGNMENT AGAINST R.R. WHICH PERMITS WETLAND RESTORATION AT GREATER STRUCTURAL AND R.O.W. COST. POSSIBLE R.R. IMPACTS.

FIGURE 5

TRADE-OFFS BY CHANNEL SEGMENT

There are few significant differences in terms of construction impacts. Alternatives C1, D, D1, and F; and to a lesser extent, A1, B1, and C; will involve a greater acquisition and displacement of private and public property than Alternatives A, B, and E. Alternatives B and D (also B1 and D1) will cause a temporary (2-4 weeks) disruption of traffic on Mill Street. All of the alternatives will temporarily block the intersection at Hope and Taylor Streets. The alternative A, B, C and D1 (also A1, B1, and C1) levees; and the embankment behind the Alternative F bulkhead; will also result in filling part of a small area of upland vegetation between the railroad and the existing levee. This habitat is not considered significant for wildlife and the impact should be considered minor. Alternative D will result in less fill in this area, but still may also cause a minor construction impact to vegetation.

There are also some tradeoffs involving access to the authorized existing boat moorings and the public dock at the end of Catherine Street. Each of the alternatives will restrict access to them during construction.

Several minor impacts are associated with each of the alternatives. These include: minor additions of impervious surface; minor additional flow into the salt ponds to the west only during rare flooding events (Leslie Salt Co.); and temporary construction impacts such as dust, vehicular emissions, noise, soil compaction, soil disruption, and blocking of roadways and boat moorings. These impacts are either temporary or considered to be minor and mitigable, based on approaches provided in this report.

It is difficult to select one alternative based on environmental criteria alone, because the tradeoffs involve comparing unlike results valued differently by the various interested agencies and individuals. In addition, future land use decisions by the U. S. Wildlife Refuge will influence which alternative they would prefer at that time. However, given the additional benefits provided by protecting historic structures and relocation of the Yacht Club (as well as allowing for future marsh restoration opportunities on the refuge property), Alternative D1 appears to be the apparent best project.

## STUDY APPROACH

The study approach undertook the following elements: (1) Contacting interested agencies and officials to elicit comments and ensure identification of all relevant issues, (2) Conducting focused field baseline studies of site archeology, and terrestrial and wetland ecological resources, (3) Completing the Santa Clara Valley Water District Environmental Impact Assessment Checklist (see the end of this Study) to identify potential impacts and focus additional study on key concerns, and (4) Evaluating comparative potential impacts of each alternative (including the "No Project" alternative).

## AGENCY COORDINATION

Representatives from interested agencies were contacted at the beginning of the project to identify potential concerns and, following the formulation of preliminary alternatives, to review the proposed options, offer comments, and recommend mitigation measures. Most of these agencies are not able to issue formal and official comments on a proposed project until they have reviewed a formal document, such as the January 1983 Engineer's Report and Draft Negative Declaration. Written responses to the Draft Negative Declaration appear in Appendix F. It is anticipated that the following permits, licenses, or other types of agreement may be required:

| Agency | Permit, License, or Agreement |
|---|---|
| U.S. Wildlife Service, San Francisco Bay National Wildlife Refuge | Purchase or lease of right-of-way |
| U.S. Fish and Wildlife Service | To be determined |
| U.S. Army, Corps of Engineers | To be determined |
| California State Land Commission | Revisions to present lease |
| The Bay Conservation and Development Commission | Administrative Permit |
| California Department of Fish and Game | 1601 Permit |

The following agencies were contacted:

### Federal

U. S. Wildlife Service San Francisco Bay National Wildlife Refuge was contacted via telephone conversation, field inspection, and letter regarding potential interactions between Wildlife Refuge property and the proposed project.

U. S. Fish and Wildlife Service Environmental Services Branch ,was contacted via letter and field inspection regarding potential project concerns relative to fish and wildlife on adjacent Federal lands, particularly in wetland areas.

National Oceanic and Atmospheric Administration, Marine Fisheries Services was contacted via telephone conversation and letter regarding potential concerns with fisheries and wetland areas adjacent to the project site.

U. S. Army Corps of Engineers was contacted via letter, telephone conversation, and field inspection regarding requirements for a Corps permit, as well as concerns with channel dredging and use of the inland waterway.

State

California State Lands Commission was contacted via letter and telephone conversation regarding potential land ownership conflicts and the issue of access to existing boats and moorings along Guadalupe River and any lands below the high water mark under tidal influence.

The Bay Conservation and Development Commission was contacted regarding an administrative permit for dredging and filling operations, and impacts of the project on the Bay Access Plan.

California Department of Fish and Game was contacted via letter, telephone conversation and field inspection regarding the needs for a 1601 permit and potential impact on wildlife or wildlife habitats within the project area.

State Office of Historic Preservation was contacted regarding their concerns with the structures in the National Historic Register District located within the project area.

Local

Santa Clara County Department of Parks and Recreation was contacted regarding their concerns over recreational issues associated with the project, particularly the potential for a bayside trail on the levees.

Santa Clara County Heritage Commission was contacted regarding their concerns with the National Register District and, in particular, the historic village of the Port of Alviso.

City of San Jose Historic Landmarks Commission was also contacted regarding the National Historic Register District.

San Jose Department of Public Works was contacted regarding potential impacts of project construction on existing streets, water lines, and sanitary and storm sewers.

San Jose Planning Department was contacted to confirm that the Santa Clara Valley Water District will be the lead agency in developing environmental documentation and conducting the initial project review. Land use documents and other information was collected from the Planning Department during the course of the study as needed.

Santa Clara County Pathways and Trails Subcommittee was contacted regarding potential location of a bayside trail on the proposed levees.

Pacific Telephone Company was contacted regarding potential impact of project construction on their telephone lines and equipment.

Southern Pacific Transportation Company was contacted regarding their concerns with the design of levees near the railroad tracks at the southern end of the site.

Pacific Gas and Electric Company was contacted regarding potential impacts of project construction on their gas and electric utilities.

The South Bay Yacht Club was contacted via telephone and a meeting regarding their potential concerns for the area adjacent to the Yacht Club including the visual impact of engineering solutions and the potential for engineering solutions which might reduce dredging needs in the channel. They were also contacted through various telephone conversations and meetings regarding the possible relocation of their clubhouse.

# ENVIRONMENTAL IMPACT EVALUATION AND MATRIX

## Impact Matrix

An evaluation matrix (Figure 6) is used to compare the potential impacts of the "No Project" alternative and each of the alternative projects considered. Impacts are not weighted or summed to avoid obscuring subjective decisions regarding the levels of significance and the priority of impacts.

Impacts are evaluated on the basis of their significance (3 = significant impact, 2 = minor impact, 1 = insignificant impact); duration (L = long-term, permanent change, S = short-term, temporary change usually during the construction phase); and their direction (+ = Beneficial, suggesting that the alternative could result in a positive environmental effect, - = Deleterious, indicating that the alternative appears to result in a negative environmental effect, or 0 = Neutral, suggesting the issue is either irrelevant for a particular alternative or that existing conditions will not be changed). Where insufficient data exist or judgements of significance or duration were not possible, the matrix entry indicates a (?)

Criteria for determination of significance are based on several factors. First, the areal extent of the effect is considered. Second, the total magnitude of the effect is estimated, generally based on input from the relevant regulatory agency. Finally, the possibilities for secondary impacts are considered. For example, erosion during construction could produce the secondary effect of temporarily increased turbidity in the stream.

Explanation and documentation for each entry where there are apparent impacts follow the matrix.

## Geology and Soils

Soil Disruption and Compaction: During construction, the earth materials which currently make up the levees and soils adjacent to the levees will disturbed and compacted where levee widening and construction staging will take place. The areal extent of disruption will vary with the alternatives. Generally, each alternative (other than Alternative E) will involve a levee bottom width of from 30 to 60 feet with an additional area for construction staging of 20 to 50 feet.

Figure 6

## 4.10 IMPACT EVALUATION MATRIX

| Potential Impacts | No Project | A | B | C | D | E | F | D1** |
|---|---|---|---|---|---|---|---|---|
| GEOLOGY & SOILS | | | | | | | | |
| Soil Disruption & Compaction | 0 | -1 S | -1 S | -1 S | -1 S | -1 L | -1 L | -1 S |
| Erosion Potential | 0 | -1 S | -1 S | -1 S | -1 S | -1 S | -1 S | -1 S |
| Seismic Hazards | -2 L | ? | ? | ? | ? | ? | ? | ? |
| AIR QUALITY | | | | | | | | |
| Vehicle Emissions & Dust | 0 | -1 S | -1 S | -1 S | -1 S | -1 S | -1 S | -1 S |
| HYDROLOGY | | | | | | | | |
| Drainage Alterations | 0 | -1 L | -1 L | -1 L | -1 L | -1 L | -1 L | -1 L |
| Flood Protection for Alviso | -3 L | +3 L | +3 L | +3 L | +3 L | +3 L | +3 L | +3 L |
| Flood Flow to Cutoff Area | 0 | +1 L | 0 | +1 L | 0 | +1 L | +1 L | 0 |
| Flood Flow to Salt Ponds | 0 | -1 L | -1 L | -1 L | -1 L | -1 L | -1 L | -1 L |
| NOISE | | | | | | | | |
| Construction Noise | 0 | -1 S | -1 S | -1 S | -1 S | -2 S | -2 S | -1 S |
| BIOTIC ISSUES | | | | | | | | |
| Disruption to Wildlife Refuge | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Habitat Reduction* | 0 | 0 | 0 | 0 | 0 | 0 | -3 L | 0 |
| Disruption to Threatened or Endangered Species | 0 | 0 | 0 | 0 | 0 | 0 | ? | 0 |
| COMMUNITY ISSUES | | | | | | | | |
| Community Plans & Goals | -3 L | +3 L | +3 L | +3 L | +3 L | +3 L | +3 L | +3 L |
| Private Land Displacement | 0 | -1 L | -1 L | -1 L | -1 L | 0 | 0 | -1 L |
| Growth-Inducing Potential | 0 | ±1 L | ±1 L | ±1 L | ±1 L | ±1 L | ±1 L | ±1 L |
| Utilities Disruption | 0 | -1 S | -1 S | -1 S | -1 S | -1 S | -1 S | -1 S |
| Visual Concerns | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ACCESS/CIRCULATION | | | | | | | | |
| Access to Channel & Moorings | 0 | -1 S | -1 S | -1 S | -1 S | -1 S | -1 S | -1 S |
| Interruption to Traffic | 0 | 0 | -1 S | 0 | -1 S | 0 | 0 | -1 S |
| RECREATION | | | | | | | | |
| County Marina | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Trail Access | 0 | +2 L | +2 L | +2 L | +2 L | +2 L | +2 L | +2 L |
| Enhance Recreational Opportunities for Refuge | 0 | -1 L | +1 L | -1 L | +1 L | -1 L | -1 L | +1 L |
| CULTURAL | | | | | | | | |
| Archaeological Resources | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| National Historic Register District | -1 L | +2 L | +2 L | -2 L | -2 L | +2 L | +2 L | +2 L |

Note: Alternatives A1, B1 and C1 result in the same impacts as A, B and C respectively except for relocation of the South Bay Yacht Club and Hope Street, considered a positive impact for the club.

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*Where (0) is given for project alternatives, no impact to salt marsh occurs; insignificant impact to upland vegetation occurs in southern reach.

**Proposed Project

The major natural soil association in the project area is the Alviso Association. It consists of fine textured soils influenced by tidal water. The soils are very poorly drained and have developed into gleyed fine textured alluvium (Draft Environmental Statement, San Francisco Bay Wildlife Refuge, 1976). These soils generally occupy level tidal flats at elevations from sea level to 10 feet, averaging 6 to 10 inches in thickness.

For the most part, the existing area which will be affected by the project is a mixture of these natural soils (heavily disturbed) with fill material used for old levee and building construction, and debris from many years of water-related use.

Given the existing disturbance and the fact that no significant vegetation growth occurs on the soils or fill material, additional soil disruption should be considered a minor impact and does not warrant mitigation. There are no significant differences between alternatives.

Erosion Potential: Increased rates of erosion are probable where soil is disturbed, until these areas revegetate or otherwise stabilize. Channel slope protection will be required only for wave protection at the far end of the peninsula on the Fish and Wildlife property (Alternatives A, A1, C, C1 and E). All other levee slopes will be seeded with a groundcover to aid in soil binding wherever feasible. (Channel velocities will be low enough to be non-eroding.)

Local Geology and Seismic Hazard: (See also the Project Geotechnical Report prepared by Woodward-Clyde Consultants and dated January 13, 1983.) Two distinct units comprise the geologic formations underlying this area: an older bedrock unit and a younger unconsolidated sedimentary sequence. The bedrock is composed of sandstone, siltstone, chert, and greenstone in the Franciscan formation. Alluvial material deposited on the bedrock consists mostly of silty clay and loose to medium sand and gravel. The thickness of this older Bay mud ranges from less than 1 foot to more than 200 feet. The younger Bay mud varies in thickness in the South Bay from a few feet at the southern shoreline to about 30 feet to the north of the project area (Draft Environmental Statement of the San Francisco Bay Wildlife Refuge, 1976).

The Alviso area is one of the most seismically active areas in the State. Numerous faults and inferred faults are found in the Santa Clara Valley floor and the Bay shoreline. In the Guadalupe River Basin, the predominant faults trend north to southeast. The nearest major faults in the study area are the

San Andreas, approximately 7 miles west of the study area; the Calaveras Fault System, roughly 5 miles east of the study area; and the Hayward Fault System, about 1 mile east of the study area. Two concealed fault traces associated with the Silver Creek fault zone have been mapped near or projecting through the study area. These suspected fault zones are considered less active thanthe Hayward and San Andreas Fault zones. As a result, surface faulting at the study site is not anticipated from the fault traces of the Silver Creek zone (Tudor 1977).

In addition to fault location and activity, liquefaction potential is a concern. Loose sands occuring close to the ground surface, providing the potential for liquefaction, occur in the Baylands, particularly in the vicinity of the existing stream courses near Guadalupe River (U. S. Army Corps of Engineers, 1978). Published reports from the 1906 earthquake indicate that liquefaction did occur in the Baylands (Tudor 1977). Tsunamis do not present a significant hazard in the study area (U. S. Army Corps of Engineers, 1978).

Given the limited freeboard, piecemeal construction, and questionable soundness of the existing levee, the potential risks of their cracking or breaking in a seismic event appear to be high. Each of the alternative projects will entail strengthening and raising levees, thus decreasing the likelihood for failure in a seismic event.

## Air Quality

Air quality is a regional phenomenon affected by local topography, climate, and existing land use and traffic patterns. The Santa Clara Valley and South Bay area has significant air pollution potential due to the mountains and hills which surround the valley, and the frequent temperature inversions which trap the pollution when the prevailing wind direction is from the northwest (U. S. Army Corps of Engineers, 1978).

Existing ambient conditions for the nearest air quality monitoring station (San Jose) suggest that the San Jose area, of which the project site is a part, has moderate to poor air quality. In recent years, the area has exceeded State and Federal standards for carbon monoxide and total suspended particulates as well as ozone on a number of days of the year (Bay Area Air Quality Maintenance District, 1982).

During project construction, local air quality could be degraded as a result of two sources: (1) emissions of CO, NOX, SOX, HC and particulates generated by construction vehicles and equipment; and (2) particulates (dust) generated during extensive earth moving activities. However, given the regional nature of air pollution and the short time span during which construction and earth moving will occur, it is unlikely that the proposed project will significantly change existing ambient conditions or cause the area to exceed State or Federal standards.

Emissions from construction vehicles and equipment are difficult to predict because of the variable nature of construction time and methods, and the lack of past data. The construction of the entire project will last from 6 to 9 months and be distributed over 3 to 5 acres of land. Based on standard emission rates for much construction equipment,* and considering the regional nature of the air pollution problem in Santa Clara Valley, the construction activities do not represent an additional source which would yield a significant impact on the air basin in terms of carbon monoxide (CO) or hydrocarbons (HC).

The earth moving activity necessary for levee construction could generate a considerable volume of particulates (TSP). Cowherd, et al. (1974) have estimated empirically that "moderate" earth moving activity generates 1.2 tons of particulates per acre per month of activity for a semi-arid climate in an area with moderate silt content (as exists at the project site).

There are currently no at-source standards for particulate generation from construction projects (T. Lee, Bay Area Air Quality Control Board, 1981); there is what is termed an "opacity rule" which states that no source may emit smoke or particulates which could obscure 20 percent of the visible light in an area.

Mitigation for earth moving activities generally involves wetting exposed surfaces to inhibit dust (twice per day can reduce dust by approximately 50 percent), and limiting grading activity on extremely windy days (e.g., greater than 25 to 30 miles per hour) or periods of extremely high ambient particulate levels (Cowherd et al). In 1982 there were 15 days which exceeded the total suspended particulate level standards of the Federal government. These days tend to occur during very windy periods at the end of summer. Additional mitigation for vehicle and equipment use does not seem warranted, provided that all equipment meets State emission standards.

There are no significant differences in impact between any of the proposed alternatives.

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*Note: Standard emission rates from construction vehicles for CO range from .5 (cranes) to 2.2 (tractors) pounds per hour, and for HC range from .16 (cranes, mixers) to .63 (scrapers) pounds per hour. (Source: E.P.A. 1975)

Drainage Alterations: There are two minor, insignificant drainage impacts which could occur as a result of the proposed alternatives.

Use of engineered fill for the levee and additional soil compaction in construction staging areas will add a small amount of impervious surface to the existing area and hence increase surface runoff. Levee raising Alternatives A through D1 will add more relatively impervious areas (2 - 5 acres affected) than floodwall Alternative E and bulkhead Alternative F. However, none of the alternatives will cause a significant increase in surface runoff on the landward side of the levees.

A second insignificant impact could occur at both the southern and northern ends of the project site where drainage is currently poor and winterponding occurs. Expanded levees (and to a lesser extent, floodwalls) would displace some of this ponded area with fill material.

Flood Flows and Flood Damage: The basic analysis and documentation for all flooding costs and benefits are described in the Engineer's Report. Clearly, each of the alternative projects provides flood control benefits to the community of Alviso, the Historic Register District, the County marina and recreational area, and the San Francisco Bay Wildlife Refuge recreational facilities (current and future). The "No Project" alternative allows the risk of inundation and damage from the one percent flood and more frequent events to continue.

There are several key differences in flood protection among the alternatives. By cutting off part of the U. S. Wildlife Refuge property, Alternatives B and D (also B1 and D1) do not improve the flood protection to the peninsula area (2.3 acres).

Whether or not this represents a problem is dependent on the use to which the Refuge property is put. Several options are currently being considered by the San Francisco Bay Refuge planners including: (1) Use of the existing structure on the peninsula site as a storage warehouse for maintenance equipment; (2) Use of the existing structure as an interpretive center or other recreational visitor-related function; or (3) Removal of the structure plus some type of enhancement of the area for wildlife or refuge purposes (Crabb, 1982).

If the structure is retained as a storage warehouse, then flood damage would be a concern. If, however, the Refuge chooses to restore some of the wildlife or wetland value to the area, or provide direct visitor access to the channel and marsh, then the cutoff alternative would be preferable because it leaves the open visual and pedestrian connection to the river channel.

One final flood-related issue warrants mentioning. With any of the ten alternative projects (A through F), during times of major flow the Guadalupe River water level will be higher at Alviso than for the "No Project" condition. This will increase the frequency and volume of fresh water flows into the Leslie Salt evaporators to the west. It is beyond the scope of this analysis to evaluate the potential extent of this impact. However, it is noted that for existing conditions and the one percent flood, some 6,500 acre feet of water will overflow the west bank. With any of the ten alternatives this overflow will increase by only about 800 acre feet. The change under even these ultimate conditions is negligible for the range of flows up to about 11,000 cfs, a 10 percent occurrence.

## Noise

There will be a temporary increase in ambient noise levels in the immediate project area during the construction period. Table 7 gives ambient noise levels from typical construction activities at increasing distances from the source.

TABLE 7

AMBIENT NOISE LEVELS FROM SELECTED CONSTRUCTION ACTIVITIES

| | | Distance from Source | | | |
|---|---|---|---|---|---|
| Activity | Peak Level | 50 feet | 100 feet | 200 feet | 400 feet |
| Trucking | 95 | 84-89 | 78-83 | 72-77 | 66-71 |
| Concrete Mixing | 105 | 85 | 79 | 73 | 67 |
| Bulldozer | 107 | 87-102 | 81-96 | 75-90 | 69-84 |
| Grader | 108 | 88-91 | 82-85 | 76-79 | 70-73 |
| Carpentry/House Construction | 100 | 85 | 79 | 73 | 67 |

(All figures given in dBA which is a measure combining both the power and frequency of a sound to produce a scale which roughly measures human disturbance. Source: Department of Defense 1975, Congress 1972.)

It is difficult to derive standards for the subjective decisions regarding noise disturbance. The U. S. Congress (1972) has outlined the following subjective responses to noise levels: 60-72 dBA "quiet," 72-82 dBA "acceptable," 82-92 dBA "noisy" and above 92 dBA "excessively noisy". A more stringent scale presents potential impact to humans from noise: 65 dBA - communications interference, 80 dBA - moderate hearing damage, 85 dBA - very annoying, and 95 dBA - severe hearing damage (Golden, et al. 1980).

Existing ambient noise levels have not been measured at the project site, but with the exception of boat construction activity, they are generally considered "low" and defined as acceptable for outdoor recreational areas (less than 65 dBA) (Draft Environmental Impact Report for North Taylor Street Industrial Park, 1982). Based on the preceding noise generation figures, it is likely that recreational users of the Marina, residents, visitors in the immediate area, and people using the boat moorings or the river channel near the project area could be affected by construction noise during the 6 to 9 month period when major activities are occurring. Receptors located greater than 400 feet from the actual construction activity would receive noise levels defined as "acceptable" by Federal standards. Thus, it appears that only those people in the immediate project area will be affected including: Individuals working on or using the boats at the channel moorings, visitors on the levees themselves, persons on the Wildlife Refuge property or at the Marina, or people along Hope Street adjacent to the project. Recreational use and activity in this area, with the exception of the County marina, is limited.

As the noise impact will occur only for a short time and in an area where boat construction noise already occurs intermittently, no major mitigation is warranted. There are few differences between the alternatives. However those requiring sheetpiles (E and F) will create significantly greater noise levels.

## Biotic

San Francisco Bay National Wildlife Refuge: The San Francisco Bay National Wildlife Refuge is adjacent to much of the project site. The refuge, consisting of 23,000 acres administered by the U. S. Fish and Wildlife Service, was created by Public Law 92-330 in 1978 for three major purposes: (1) Preservation of the natural resources of the South Bay, including the habitat of migratory birds, harbor seals, and five endangered species: (2) Provide environmental education opportunities to Bay Area schools and residents; and (3) Ensure protection of an important open space resource and wildlife-oriented recreation opportunities (San Francisco Bay National Wildlife Refuge, 1977).

The refuge land near the project site is designated as "open space" in the land use management scheme. This category implies an area without major colonial bird nesting sites and containing no sensitive biological habitats. Because these areas are defined as having "lowest biological sensitivity" they are subject to the fewest visitor restrictions. Pedestrian access is restricted to well-defined pathways, and general wildlife observation is considered the primary use activity (San Francisco Bay National Wildlife Refuge, 1977).

Proposed Alternatives A, C, E and F (also A1 and C1) are not expected to disrupt the operations or visitor use of the Refuge during or after construction and will not affect any of the habitat areas termed "significant" by the U. S. Fish and Wildlife Service. Alternatives A, C, E, and F (also A1 and C1) which would increase the levee heights around the perimeter of the refuge property, would inbibit any future marsh restoration of that 2 acre parcel.

In other parts of the Refuge, levees act as resting and nesting sites for migratory birds. However, it appears that as a result of human disturbance and predator access (rats, feral dogs) near the project site, the adjacent levees do not provide as rich a habitat as other Refuge levees (R. Lowe 1982, San Francisco National Wildlife Refuge 1977). Levees on the west side of the channel would seem to offer more suitable locations for bird species to use during or after project construction.

As discussed in a subsequent subsection (Recreation), by raising and widening levees, proposed alternatives with levees could provide a benefit to the Refuge by providing higher viewing platforms for visitors to see wildlife in the salt ponds and river channel.

Habitat Reduction: the attached Ecological Baseline Study was conducted by Harvey and Stanley Associates to survey existing vegetation and potential wildlife habitats. The project area was divided on the basis of type and complexity of vegetation into five sub-areas, A through E. On the basis of vegetation cover, Areas B and E were not considered wetland and would support only moderate levels of upland wildlife. These areas, which include the disturbed field and drainage sink south of the marina parking lot and theareas east of the levees along the central reach of the project, consist of mostly ruderal grasses (species growing in disturbed areas) and do not represent valuable habitat. Area A, (adjacent to the channel at the marina parking lot) is dominated by ruderal grasses on the upper edge of the levee and alkali bulrush and pickleweed (wetland indicator species) on the lower edge of the levee. Area C, (the triangular portion between the existing levee and the railroad at the southern part of the project site) is dominated by upland grasses and bare ground with minor amounts of pickleweed (8.5% of total cover). The presence of pickleweed suggests that the area may serve as habitat for some marsh wildlife, but it does not appear to be favorable for the endangered salt marsh harvest mouse. Area D, (running along the levee for most of the project reach) consists of two zones: The sloping banks of the levee containing a mixture of upland and wetland species and the mudflats at the base of the levees containing extensive wetland species. Wildlife use of the mudflat area is considered extensive including likely habitat for rails (however, not the salt marsh harvest mouse).

Each Alternative is designed to avoid the mudflat/wetland zone on the channel side of the levees. Provided that no fill material is accidentally deposited on the channel side of the existing levees, there should be no impact to sensitive wetland habitat in sub-areas A and D. The project construction manager will supervise fill activities at all times during construction. Project Alternative F (continuous tied back sheet-pile floodwall) could have a significant future impact on the wetland habitat if dredging were initiated on the channel side to improve river navigation.

Each of the alternatives would disrupt the upland grasses in sub-areas B and E and the wetland species and upland grasses in sub-area C. The major vegetation of concern in sub-area C (near the railroad) is limited to two low-lying swales of less than 0.4 acres containing some marsh grasses and which act as upland bird habitat. Because most of this vegetation is alreadydisturbed and not considered significant wildlife habitat, this impact should be considered minor. To mitigate any loss of pickleweed in sub-area C, it is possible to move the proposed levees in the southern portion of the project to the east forming an L-shaped dike which runs up against the Southern Pacific Railroad tracks, as in Alternative Project D. The potential for dredging some of the remaining upland area and restoring it to tidally-influenced wetland in the future would be favorable. However, there are several drawbacks to this approach. First, there are potential conflicts with the railroad in terms of placing a significant amount of imported material against their embankment. This could lead to settlement and a need to re-align and raise their track periodically. In addition, this alignment requires more fill, covers a larger area (2.0 acres as opposed to 1.3 acres), and is more costly ($321,000 as opposed to $122,000) than the straighter levee option of Alternatives A, B, C, and D1 (also A1, B1, and C1).

Rare, Threatened, and Endangered Species: In general, salt marsh environment north of the project area is potential habitat for six designated endangered species including the salt marsh harvest mouse, American peregrine falcon, brown pelican, California and black clapper rails, and California least tern (U. S. Army Corps of Engineers 1978). However, because the project site itself has very little suitable wetland remaining, it does not represent desirable habitat for any of these species. Dr. H. S. Shellhammer notes that the small patches of salt marsh on the channel side of the levees and in upland area C are "not favorable for the salt marsh harvest mouse", and the occurrences of California least tern, brown pelican and peregrine falcon are "very infrequent" (see Ecological Baseline Study). Only area D has been identified as likely habitat for clapper rails (California and black). Provided that all disturbance and fill material are kept on the inside of the levees and/or above Elevation 7 NGVD on the outside, none of the alternatives should pose an impact to these species.

During construction, it is likely that any wildlife including rails, ducks, or upland species will relocate to suitable habitat elsewhere. Since the existing area is disturbed frequently by boat building and other industrial activity, this does not appear to be a problem. Considerably more suitable habitat exists to the south, north and west of the project area.

## Community Issues

Community Plans and Goals: Each of the proposed alternatives is in full compliance with the land use and community plans for Alviso within the City of San Jose (General Plan for San Jose, 1975). Each of these alternatives, in providing flood control, represents an improvement over the "No Project" alternative in fulfilling the long-term goals of the community. The overall development plan for Alviso (City of San Jose General Plan, 1975) states:

> For planning and decision-making purposes, the future of Alviso will depend on the provision of adequate flood control levees in order to maintain and upgrade the existing community. Direct City action includes provision of an acceptable level of municipal services and needed capital improvements.
>
> The Alviso Planning Area includes some of the more environmentally hazardous lands in the City. Among the hazards present are land subsidence, unstable soils, and the possibility of freshwater or tidal flooding.
>
> As indicated, the most critical environmental issue within the General Plan timeframe is the need to control potential flooding. Present

> levees surrounding Alviso town and adjacent developable areas do not provide protection from a 100-year flood or tidal waters.

The implementation policy for flood control in Alviso (City of San Jose General Plan, 1975) states:

> Continue to monitor and encourage efforts by Santa Clara Valley Water District and/or U. S. Army Corps of Engineers to provide flood protection to Alviso and North San Jose.

In the absence of additional flood control measures (the "No Project" alternative), flood risks from Guadalupe River will continue and the goals and policies stated for Alviso will not be met.

Private Land Displacement: Expansion of existing levees will require acquisition of additional right-of-way and displacement of a small amount of private land in several reaches along the channel. The acquisition of private lands would be greatest for Alternatives C1, D, D1 and F; and considerably less for Alternatives A, B, and E.

Growth-Inducing Potential: In general, existing General Plan policy of the City of San Jose discourages new residential development in Alviso because of the severe flood hazard conditions. This project alone, however, does not provide the full protection needed to revise current policy. When both this project and the ring levee (now under study by the city) are complete, the opportunities for future commercial and residential development will be enhanced, and may require reconsideration of the City's growth policy for Alviso.

It should be noted that commercial development at a scale appropriate to the size and character of the community is encouraged in the vicinity of the project to revitalize economic activity, increase the local tax base and provide employment opportunities. As stated in the City of San Jose General Plan:

> With a city commitment to maintain and upgrade the Alviso community, the westerly grid of the town has excellent potential as a specialty commercial area built around an historic and bay-oriented theme. Commercial development could involve historic restoration and new construction sensitive to the character and environmental constraints of the area. Such development should be pedestrian oriented, intimate, and on a human scale.

Thus the project can be viewed as compatible with local growth policy.

Disruption of Utilities: During the construction period, there will be a temporary disruption to local utilities including gas, water, telephone, sewer and electrical lines. It should be noted that the private utilities and the City of San Jose Public Works Department have been informed about construction plans and are cooperating in project planning to insure that adequate service will be provided, and that any necessary facilities will be installed during the construction phase. No additional mitigation is warranted.

Visual Considerations: In general, visual impacts are not significant because the existing project area is heavily disturbed containing piles of rubble, debris, existing earth levees and mounds of soil. Following construction, there will be a change in the view lines available to visitors and residents of Alviso, because the levees or floodwalls will be higher and wider. To the extent that floodwalls and bulkheads are less visually compatible with surrounding salt marshes than are earthen levees, Alternatives E and F would present slightly greater visual impacts. In addition, levees provided in Alternatives A through D1 would provide more opportunity for future revegetation (natural or planted) than would the Alternative E floodwall and the Alternative F bulkhead. Because of existing visual conditions, no mitigation is warranted.

## Access and Circulation

Access to Channel and Boat Moorings: Two channel access issues are of concern: (1) Access to the authorized existing dock and boat mooring facilities in the river channel; and (2) The public dock at Catherine Street.

Currently, as many as 60 to 70 recreational and residential boats use the moorings at any given time, extending along nearly 60 percent of the project area. During construction, use of these moorings will be disrupted, and, following construction, direct access over the levees or floodwalls will be more difficult than at present. To mitigate this problem, several stairways will be provided for Alternative A through E. For Alternative F the exisitng float gangplanks would have to be attached to the top of the new bulkhead wall. However, it should be noted that many of the boats moored between Catherine and Mill Streets are moored without legal authorization.

The U.S. Wildlife Refuge has no immediate plans for the existing boat launching area at Mill Street. It is partly on their property and partly on the property of the State Land Commission which does not appear to be interested in such use either. In the past, larger boats (up to 65 feet in length) which cannot be launched at the County Marina are set in the water there. The County has been considering future marina expansion. One of their options is to relocate their launching ramp onto the Refuge property and allow it to extend into the deepest part of the channel (Rockwell 1982). If this occurs, Alternatives B and D (also B1 and D1) would provide a positive benefit by allowing direct trailer access from the existing marina parking lot along the top of the levee to the new ramp. Alternatives A, C, E, and F (also A1 and C1) would require changes to levees, floodwalls, or bulkheads to allow access to the new ramp.

The public dock at Catherine Street will be impacted by each of the alternatives. It is currently used to transfer cargo and launch boats by crane, or to directly roll loads on or off barges. Alternatives A through E include ramps at least 24 feet wide to continue access to the dock. For Alternative F, the top of the tied back sheetpile bulkhead becomes a new dock. It would also have access ramps.

Roadway Circulation: During construction, there will be temporary disturbances to several roadways depending on which alternative is selected. For all ten alternatives a detour must be provided to allow access to the block of Taylor Street between Hope Street and the railroad as this block has no other access. Additionally, Alternatives B and D (also B1 and D1) will result in blocking access to the U.S. Wildlife Refuge peninsula for two to four weeks. If the alternatives which relocate the South Bay Yacht Club and Hope Street are selected (Alternatives A1, B1, C1, D, D1, and F), a larger portion of Hope Street will be blocked while it is permanently realigned. Since these disruptions are temporary and affect roadways which are not heavily used, the only mitigation which is warranted is to maintain general access to Taylor Street and emergency access to the Refuge warehouse area, the authorized boat moorings along the channel, and the historic structures along the project length. By phasing construction, it might be possible to block only one roadway or intersection at any given time. All ten alternatives will permanently block vehicular access from Elizabeth Street to the top of the new levee.

Following construction, Alternative A1, B1, C1, D, D1, and F would allow pedestrian and (authorized) vehicle access over the entire project length; while the others would restrict any vehicle access in some areas due to reduced width at the top of the levee/floodwall construction.

### Recreation

Santa Clara County Marina: Although most of the construction activity will occur away from the Marina, each of the alternatives will cause minor disturbance to a corner of the marina parking lot during construction of the most northerly section of levee. This impact would not be significant. However, if the boat launching ramp were to be relocated to the Refuge property as discussed earlier, then Alternatives B and D (also B1 and D1) allow easier access while the other six alternatives would present difficulties.

Trail Access: The Santa Clara County Department of Parks and Recreation and the Santa Clara County Pathways and Trails Subcommittee have expressed a desire to see a trail link for the South San Francisco Bay Trail incorporated within the project design (the existing trail follows Hope Street). A minimum trail width of six feet would be possible for any of the alternatives (six to eight feet is desirable). Any such trail would provide a positive recreational benefit by moving visitors closer to the water.

Possible Enhancement of Refuge Recreational Opportunities: Each of the alternatives could result in a positive recreational impact by providing higher vantage points from which visitors could view the salt marsh or wildlife within the Refuge. Additionally, Alternative B and D (also B1 and D1) enhance the recreational value of the Refuge peninsula property by creating an opportunity for future restoration as wetland habitat (requiring breaching of the existing levees or by maintaining direct visual and pedestrian access to the channel. This benefit is dependent on the use to which the Refuge will put its property and warehouse structure.

## Archaeological Resources

Dr. Robert Cartier of Archaeological Resource Management conducted an archaeological resource evaluation of the project area. The research included an archival search in the State records and a surface survey of the property. The archival search indicated that there are no known prehistoric resources in the vicinity, and no evidence of prehistoric resources was noted during the surface reconnaissance. It is therefore concluded that none of the proposed alternatives should have a direct impact upon prehistoric resources as the project as currently planned should involve no excavation into undisturbed native soils. Project excavation will be entirely into soil imported into the area or native soils previously disturbed. In the event, however, that redesign of the project requires excavation into undisturbed native soils, further intensive evaluation should be recommended on an ad hoc basis.

If, during the construction phase of the project, archaeological traces (human remains, artifacts, concentrations of shell/bone/rock/ash) are encountered, all construction within a fifty meter radius of the find should be stopped, the Planning Department notified, and qualified archaeologist retained to examine the find and recommend mitigations as necessary.

The detailed archaeological investigation can be found in the attached Archaeological Resource Evaluation.

## Historical Resources:

Introduction: The historic resources of the Old Port of Alviso are recognized as having national, statewide, and local significance. The "Alviso National Register Historic District" was originally nominated for inclusion in the National Historic Register in 1973 under the National Historic Preservation Act of 1966 (PL 89-665). The Act (as amended in 1974 and 1979) establishes the National Historic Register which is a list of properties worthy of preservation, not a list of properties which must be preserved. The Act applies to undertakings which receive federal funding or permits, and requires that preservation factors "be considered" by the lead agency along with other cost-benefit factors in any project decision making regarding potential impacts to historic resources. Where an historic district is involved, all structures within a district, whether they are considered a "contributing element" (i.e., contributing to the overall historic character) or simply add to the visual character of the area, may warrant consideration. However, in all cases the final authority regarding actions which are to be taken with respect to historic structures rests with the lead agency.

Historic resource considerations are also included under the California Environmental Quality Act (CEQA) which defines historical resources as one of the components of the environment to be assessed in the determination of a project's significant impacts, and which requires a lead agency to identify existing conditions, estimate potential impacts, and suggest mitigations or alternatives if known historic resources are to be affected. If an initial environmental study determines that a potential action can have a significant impact on an historic resource, then an environmental impact report must be prepared to fully document the magnitude of the impact and to prepare mitigations.

Actions which could impact the historic structures within the Port of Alviso must also comply with the laws of the City of San Jose. The City's preservation statute (City of San Jose Ordinance 20884) provides for the preservation of historic landmarks and districts and requires that historic resources be considered along with other factors in the preparation of plans and the design of projects.

Historical Background: Alviso's role as a seaport precedes that of San Francisco, going back to 1777 with the founding of the original Mission Santa Clara. The port served as a major north-south passenger and freight link between San Francisco and the South Bay, as well as the major commercial port for the Santa Clara Valley until the 1880's, when railroad competition finally made the port obsolete. Originally, the port of Alviso was a small town laid out on a grid pattern at the head of a navigable slough extending inland from the south end of San Francisco Bay.

As shown on Figure 7, the present historic district is bounded on the north by an arm of Alviso Slough; to the west by Alviso Slough, the 1850 canal, and Guadalupe River; to the south by Moffat Street; and the eastern boundary consists of a line down the center of Gold Street to Catherine Street, west on Catherine to the center of the block between Eldorado and Gold, and then south to Moffat.

The town was officially platted in 1851. By this time, there were several warehouses along Alviso Slough (formerly Steamboat Slough). One of these early warehouses, the Old Union Warehouse, (also known as the Ice House) is still standing at the corner of Elizabeth and Catherine Streets. There are many historic structures remaining in the district from Alviso's heyday of 1849-1900. Among them are: The Old Union Warehouse and Docks (ca. 1858); the Laine Residence (1887) and Store (ca. 1860) at 970 and 996 Elizabeth Street; the Trevey Residence (1902) at 1413 El Dorado Street; the Railroad Depot (1904) at the southeast corner of Eldorado and Elizabeth Streets; Captain John Martin's House (ca. 1860) at 1080 Catherine Street; the La Montagne Boarding House (ca. 1887) at 1440 Catherine Street; the South Bay Yacht Club (1905) at the northeast corner of Hope and Taylor Streets; Wade's 'Round the Horn House (ca. 1855) and Warehouse (ca. 1860) at 1641 and 1657 Eldorado; the Constable Office and Jail (ca. 1865) at 1621 Eldorado; and the Bayside Cannery at 907 Elizabeth Street.

Information pertaining to historic structures comprises data from several sources; the National Register of Historic Places Inventory-Nomination Form, certified on August 22, 1973; and the Santa Clara County Heritage Resource Inventory, 1975 and the 1979 update. The City of San Jose inventory is currently in draft form, but apparently includes the project area (Jan Miller,

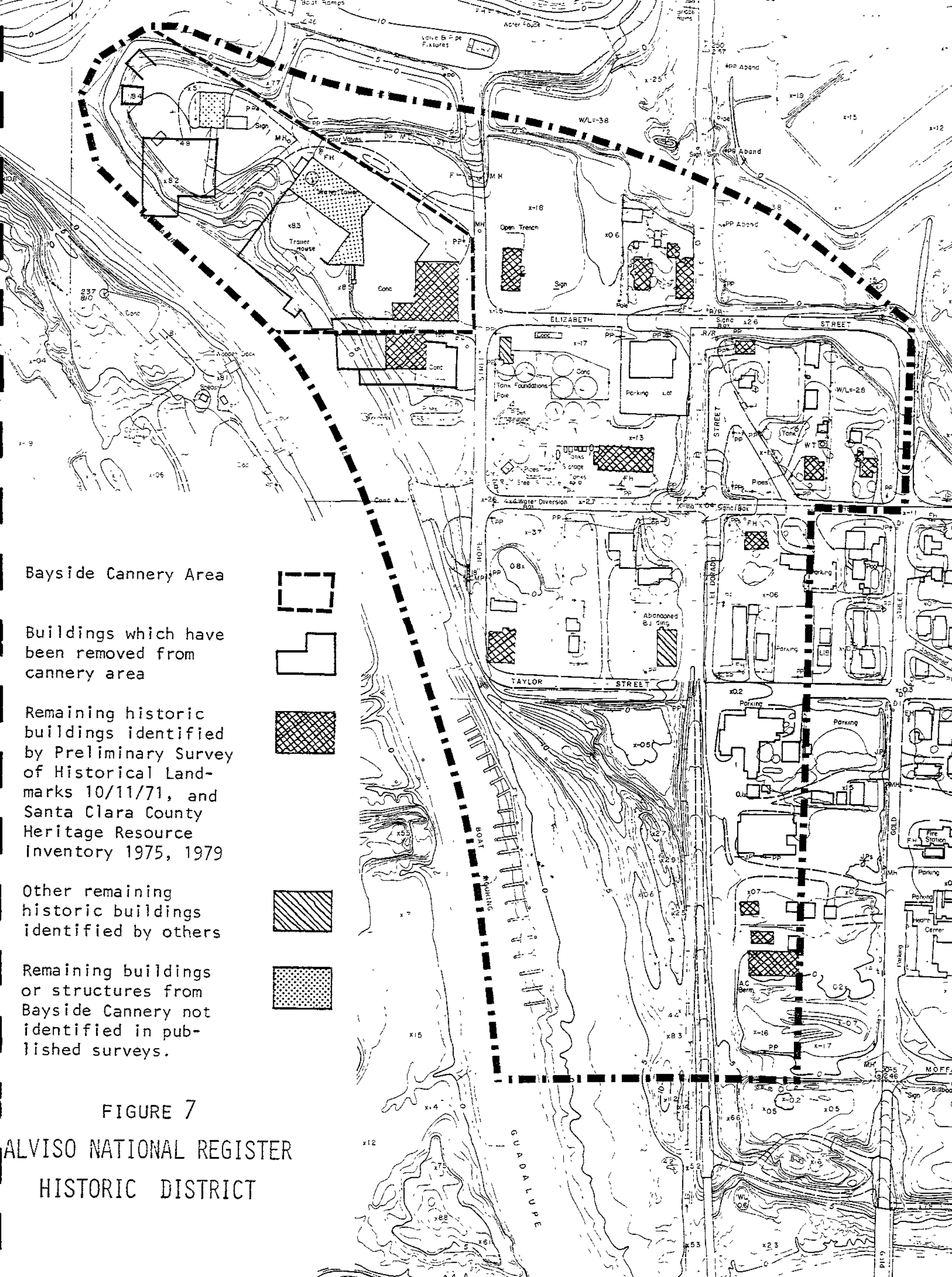

FIGURE 7

ALVISO NATIONAL REGISTER HISTORIC DISTRICT

City of San Jose). According to the City of San Jose Historic Landmarks staff, this inventory will not contain any structures which are not listed on the County inventory.

Within the Historic District only the Yacht Club, the Old Union Warehouse (Ice House) and the Bayside Cannery Complex are relevant to the project. Of these, the Yacht Club and the Old Union Warehouse are identified in the revised application for the National Register of Historic Places, 1973.

The Bayside Cannery Building (907 Elizabeth St.) is identified in the Santa Clara Heritage Resource Inventory of 1979. Although other buildings of the Bayside Cannery complex are in the project area, they are not specifically identified in the existing surveys. Figure 7 indicates the remaining buildings within the Bayside Area complex as well as those which have been removed as a result of prior levee construction. All structures within the historic district are subject to consideration by the lead agency.

The Fish and Wildlife Service of the Department of the Interior has acquired five acres of the Historic District. It has been proposed that they be rehabilitated by the Federal government as part of the new San Francisco Bay National Wildlife Refuge. Under the National Historic Preservation Act, it is possible for National Register districts to receive federal funding for their enhancement and restoration.

Potential Impacts: The proposed alternatives create both positive and negative impacts in terms of the restoration potential of the buildings. Each of the alternatives will provide flood protection from the 100-year event for the historic buildings in question and will provide a positive benefit not offered by the "No Project" alternative. However, Alternatives C, Cl, and D could result in removal or disturbance of portions of the historic buildings while the rest do not. It is possible that major damage could occur to the historic buildings due to intense vibrations associated with construction of the sheetpile floodwall for Alternative E and the sheetpile bulkhead for Alternative F. Placing any embankment could potentially cover historic artifacts which may have some significance.

A variety of mitigation measures may be possible to mitigate the impacts of alternatives on the historic buildings. However, only a few may be practical due to structural condition of the buildings and the associated cost of applicable measures. Walls of the structure could be braced structurally from behind to withstand the weight of fill material, or the walls could be removed and the remaining building braced; both of these approaches would appear to offset the savings sought by this approach as an alternative to floodwall protection outside of the buildings. Floodwalls could be used to prevent encroachment onto the buildings. Physical relocation of these buildings, other than the Yacht Club, appears to be structurally impractical. Where alternatives for bracing and working around old structures are contemplated, the exposure of construction workers to the risk of collapse from these structures must be considered. For all of the alternatives, vibration from earth-moving activities and heavy construction could also further weaken the remaining brick walls of the Old Union Warehouse or nearby structures. It should be noted that construction of the existing levee in 1958 required removal of the rear portions of several structures. Care should be exercised at construction staging areas to ensure that equipment does not damage historic structures.

Alternative A does not require removal or disturbance of any existing structure. A floodwall is built around the back of the existing Fish and Wildlife building on the peninsula on their property, another floodwall is built behind the cannery buildings south of Mill Street and the Old Union Warehouse, and a retaining wall is built across the street from the South Bay Yacht Club.

Alternative B is comparable to Alternative A except for the cut-off levee across the Fish and Wildlife property. The cut-off alignment leaves the Fish and Wildlife building on the peninsula unprotected from the design flood. While this building is a part of the Bayside Cannery Complex and lies within the National Register Historic District, a local survey disclosed that it has little historic significance of its own.

Alternative C would require a floodwall behind the Fish and Wildlife building; bracing or backfilling portions of the still standing cannery buildings; and removal of the Old Union Warehouse (bracing or partial backfilling are not considered practical solutions). Again a retaining wall is built across the street from the South Bay Yacht Club.

Alternatives A1, B1 and C1 are the same as their counterparts (A, B, and C) except that instead of using a retaining wall at the South Bay Yacht Club, the clubhouse is relocated and the existing levee raised and widened.

The Alternative D cut-off levee leaves the Fish and Wildlife building unprotected from the design flood; requires bracing or backfilling portions of the still standing cannery buildings; and removal of the Old Union Warehouse. The South Bay Yacht Club is relocated.

The Alternative D1 cut-off levee also leaves the Fish and Wildlife building unprotected but does not disturb any other building except for relocating the South Bay Yacht Club.

Alternatives E and F protect the Fish and Wildlife building from the design flood and do not disturb any other building except that Alternative F requires relocation of the South Bay Yacht Club. However, these two alternatives present the greatest danger of vibration-caused damage to the historic buildings.

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## PERSONS CONTACTED

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Karen Miller - U.S. Fish and Wildlife Service

Ruth Pratt - U.S. Fish and Wildlife Service

Roger Wolcott - Marine Fisheries Service

Nancy Elders - California Department of Fish and Game

Lt. John Peabody - California Department of Fish and Game

Walt Smith - California Department of Fish and Game

Nick Del Cioppo - State Office of Historic Preservation

Marian Wilson - State Office of Historic Preservation

Aaron Gallup - Architectural Historian - State Office of Historic Preservation

Felice Errico - Santa Clara County Parks and Recreation Department

Roberta Jamison - Santa Clara County Heritage Commission

Arthur Ogilvie - County Planning Department

Jack Douglas - President, City of San Jose Historic Landmark Commission

Jerry De Young - Vice President, City of San Jose Historic Landmarks Commission, San Jose Historical Museum

Jan Miller - City of San Jose, Office of Private Development, Historic Landmarks Staff

Clyde Arbuckle - local resident

Garland Oliver - Alviso Resident

# ENVIRONMENTAL IMPACT ASSESSMENT CHECKLIST

Explanations of all "Yes" and "Maybe" answers are required on attached sheets. If impact occurs during construction or is temporary, indicate with a "C" or "T" under Yes or Maybe.

| | Yes | Maybe | No |
|---|---|---|---|
| 1. Geology and Soils. Will the project result in: | | | |
| a. An increased hazard to the public resulting from geologic features of the site (landslide-prone areas, faults, slumping, etc.)? | | | X |
| b. Serious disruptions, displacements, compaction, or impervious covering of the soil? | X | | |
| c. Introduction of toxic materials in the soil or reduction of soil fertility? | | | X |
| d. Significant change in topography or ground surface relief features? | X | | |
| e. The destruction, covering or modification of any unique geologic or physical features? | | | X |
| f. Any substantial increase in wind or water erosion of soils, either on or off the site? | | C | |
| g. Changes in siltation, sediment transport, deposition or erosion which may modify a river, stream, or other body of water? | | C | |
| 2. Air. Will the project result in: | | | |
| a. Generation of air emissions (such as dust) that will seriously deteriorate air quality standards (either locally or regionally)? | | C | |
| b. The creation of objectionable odors? | | | X |
| c. Major alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally? | | | X |

| | Yes | Maybe | No |
|---|---|---|---|
| 3. Water. Will the project result in: | | | |
| a. Changes in currents, or the course or direction of water movements? | | X | |
| b. Changes in infiltration rates, sedimentation, drainage patterns, or the rate and amount of surface water runoff? | X | | |
| c. Alterations in the course or flow of floodwaters? | X | | |
| d. An increase in downstream flood potential that might cause property damage? | | X | |
| e. Change in the amount of surface water in any body of water? | | X | |
| f. Contamination or any detrimental effect on existing water quality or quantities of either surface or subsurface supplies? | | | X |
| g. Change in the quantity of groundwaters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations? | | | X |
| h. Reduction in the amount of water otherwise available for public water supplies? | | | X |
| 4. Noise. Will the project increase existing noise levels during construction or operations to the extent that existing or future residents would be annoyed? | | C | |
| 5. Plant Life. Will the project result in: | | | |
| a. Change in the diversity of species, or numbers of any species of plants (including trees, shrubs, grasses, microflora, and aquatic plants)? | | X | |
| b. Reduction of the numbers of any unique, rare or endangered species of plants? | | | X |
| c. Introduction of new plant species into an area, or a barrier to the normal replenishment of existing species? | | | X |

| | Yes | Maybe | No |
|---|---|---|---|
| 6. Animal Life. Will the project result in: | | | |
| a. Changes in the diversity of species, or numbers of any species of animals (birds, land animals, including reptiles, fish and shellfish, benthic organisms, insects or microfauna)? | | | X |
| b. Loss or disturbance of a nesting area for resident or migrating birds? | | C | |
| c. Reduction of the numbers of any unique, rare or endangered species of animal? | | | X |
| d. Introduction of new species of animal into an area, or result in a barrier to the migration or movement of animals (or fish)? | | | X |
| e. Deterioration of existing fish or wildlife habitat? | | | X |
| 7. Land Use/Community Plans and Values. Will the project result in: | | | |
| a. Alteration or nonconformance with regional, federal, state or local land use plans and policies of the surrounding area? | | | X |
| b. Conflict or inconsistency with adopted policies, plans and goals of the community where the project is located? | | | X |
| c. Deterioration of the integrity or quality of the surrounding neighborhood? Loss of privacy or security to residents over the long term? | | | X |
| d. Generation of a substantial public controversy resulting from environmental concerns? | | | X |

| | Yes | Maybe | No |
|---|---|---|---|
| 8. Economic. Will the project: | | | |
| a. Foster economic or population growth, either directly or indirectly, in the surrounding area (particularly if faster than planned for)? | | | X |
| b. Remove a major constraint or obstacle to growth? | | X | |
| c. Decrease employment in the community? | | | X |
| d. Reduce acreage or yield of an agricultural crop? | | | X |
| 9. Population. Will the location, distribution, character, or density of the surrounding human population be altered by the project? | | | X |
| 10. Housing. Will the project adversely affect existing housing or result in the relocation of existing housing? | | | X |
| 11. Transportation/Circulation. Will the project result in: | | | |
| a. An adverse impact upon existing transportation systems? | C | | |
| b. Reduction in existing parking facilities, or create demand for new parking? | | C | |
| c. Alterations to present patterns of circulation or movement of people and/or goods? | X | | |
| d. Increase in traffic hazards to motor vehicles, bicyclists, or pedestrians? | | | X |
| 12. Public Services. Will the project result in a need for new or altered governmental services in any of the following areas: | | | |
| a. Fire or police protection? | | | X |
| b. Schools? | | | X |
| c. Parks or other recreational facilities? | | | X |

| | Yes | Maybe | No |
|---|---|---|---|
| d. Maintenance of public facilities (streets, highways, public transit, etc.)? | | | X |
| e. Flood Protection? | | | X |
| f. Other governmental services? | | | X |
| 13. Utilities. Will the project result in a need for new systems, or alterations to the following utilities: | | | |
| a. Power or natural gas? | | | X |
| b. Communications systems? | | | X |
| c. Water? | | | X |
| d. Sewers or septic tanks? | | | X |
| e. Storm water drainage? | | | X |
| f. Solid waste disposal? | | | X |
| 14. Energy. Will the project result in: | | | |
| a. Use of substantial amounts of fuel or energy? | | | X |
| b. Substantial demand upon existing sources of energy, or require the development of new sources of energy? | | | X |
| 15. Public and Environmental Health. Will the project result in: | | | |
| a. Creation of any known human health hazard or potential health hazard (excluding mental health but including physical injury)? | | | X |
| b. Involve the application, use, or disposal of toxic or hazardous materials? | | | X |
| 16. Aesthetics. Will the project result in the obstruction or elimination or any scenic vista or view open to the public, or will the project result in the creation of an aesthetically offensive site or structure presently or potentially open to public view? | | X | |

| | Yes | Maybe | No |
|---|---|---|---|
| 17. Recreation. Will the project result in an impact upon the quality or quantity of existing recreational opportunities (such as fishing, boating, hiking, horseback riding, bicycling)? | | | X |
| 18. Archeological/Historical. Will the project result in an alteration of a significant known archeological or historical site, structure, object or building? Is the project in a known archeologically sensitive area? | | X | |
| 19. Natural Resources. Will the project substantially increase the consumption of an non-renewable natural resource such as minerals, precious metals, prime agricultural land, natural gas, oil, etc.? | | | X |
| 20. Mandatory Findings of Significance. | | | |
| a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | | | X |
| b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time while long-term impacts will endure well into the future.) | | | X |
| c. Does the project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environment is significant.) | | | X |

| | Yes | Maybe | No |
|---|---|---|---|
| d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? | | | X |

# DETERMINATION

On the basis of this Initial Study:

☒ I find the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project.

☐ I find the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

Prepared by

Environmental Specialist
Title

Date: January 18, 1983

# ATTACHMENTS

# ARCHEOLOGICAL RESOURCE EVALUATION OF THE GUADALUPE RIVER PROJECT EXTENTION: THE AREA NORTH OF THE SOUTHERN PACIFIC RAILROAD BRIDGE, IN ALVISO, COUNTY OF SANTA CLARA

FOR
THE PLANNING COLLABORATIVE, INC.
#6080-1489-X

BY
ARCHEOLOGICAL RESOURCE MANAGEMENT
ROBERT CARTIER, PRINCIPAL
NOVEMBER 1982

## ABSTRACT

An archeological resource evaluation was conducted for the proposed expansion of existing levees along the Guadalupe River, north of the Southern Pacific Railroad bridge in the Town of Alviso, County of Santa Clara. The research included an archival search in the State records and a surface survey of the property. The archival search indicated that there are no known prehistoric resources in the vicinity of the subject area, and no evidence of prehistoric resources was noted during the surface reconnaissance. Historic resources are extant adjacent to the subject area; however, their evaluation is out of the scope of this report. It is therefore concluded that the proposed project should have no direct impact upon prehistoric resources as the project is currently planned should involve no excavation into native soils. Should the proposed project be altered and excavation into native soils be unavoidable, then further evaluation can be recommended on an ad hoc basis.

## LOCATION AND DESCRIPTION OF THE SUBJECT AREA

The subject area is located on the east side of the Guadalupe River, between the Southern Pacific Railroad bridge and the Alviso Marina, in the Town of Alviso, County of Santa Clara. On the USGS 7.5 minute quadrangle of Milpitas, the Universal Transverse Mercator Grid locations are $^{41}2900/^{5}90500$ on the northern end of the project and $^{41}42000/^{5}90500$ on the southern end. The elevation ranges between three and seventeen feet, and the nearest source of fresh water is the Guadalupe River.

At the time of the archeological reconnaissance, the surface visibility was clear for inspection; however, it was covered with historic trash and almost all of the project seems to lie in areas where imported soils, rock, and trash have been imported to raise the elevation for flood control thus effectively covering the original soils.

The proposed project is an extention of the Guadalupe River Flood Control Project, and consists of the expansion of the levee system through a number of possible methods including raising of the existing levees with imported fill material, construction of additional "shortcut" levees, or the construction of floodwalls where necessary to protect historic buildings. The current plan does not propose any excavation into native soils where potential prehistoric resources may lie buried beneath historic fill.

## REQUEST FOR ARCHEOLOGICAL EVALUATION

The archeological evaluation was carried out to determine the presence or absence of any significant prehistoric resources in the subject area. Archeological services were requested in October 1982 in order to: 1) undertake an archival study of the cultural resources in the vicinity of the property, 2) conduct a surface survey of the land, and 3) to provide a written report of the findings that would include any recommendations that would be appropriate.

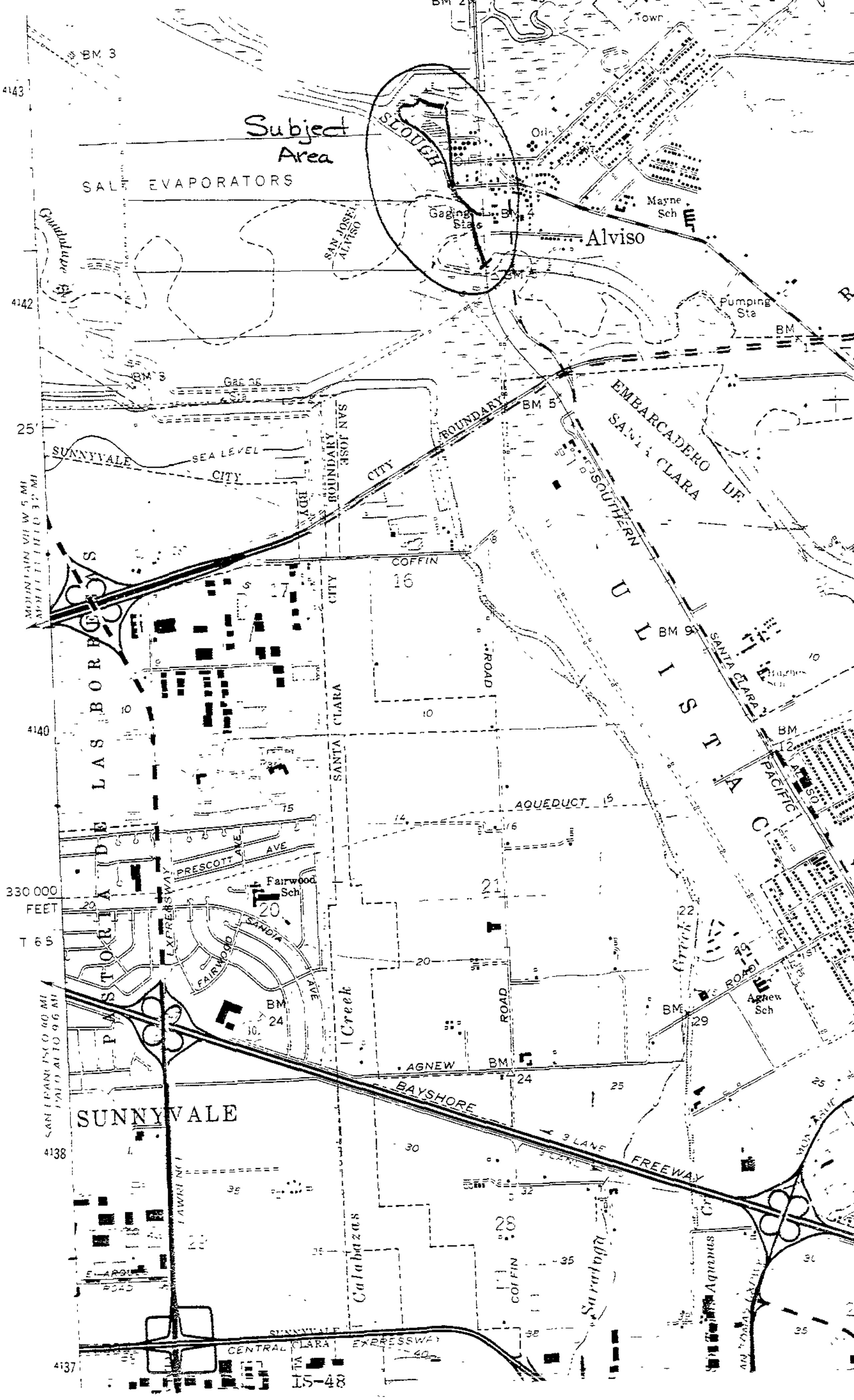
## ARCHEOLOGICAL SURVEY

Archival: Prior to reconnoitering the subject area, a study of the maps and records at the Northwest Information Center of the California Archaeological Site Inventory was conducted for a fee of $30.00. This research into the records was done to determine if any known cultural resources were reported in or around the subject area. The archival check indicated that there are no known prehistoric sites located in the near vicinity of the subject area. The nearest prehistoric sites are CA-SCl-5 and CA-SCl-485, located some distance upstream. The subject area is part of a recorded historic site, however, CA-SCl-339H, the Port of Alviso National Register District.

Surface Survey: A "general surface reconnaissance" was conducted by the Principal Investigator over the subject area. The project area appeared to be covered entirely with imported soil and rock. No traces of prehistoric materials were noted.

## CONCLUSION AND RECOMMENDATIONS

Based upon the archival records and the surface survey, it does not appear that any prehistoric archeological resources exist within the subject area. It is therefore concluded that the proposed project as currently planned should have no direct or indirect impact upon prehistoric archeological resources. In the event, however, that redesign of the project requires excavation into native soils, further intensive evaluation should be recommended on an ad hoc basis. If, during the construction phase of the project, archeological traces (human remains, artifacts, concentrations of shell/bone/rock/ash) are encountered, all construction within a fifty meter radius of the find should be stopped, the Planning Department notified, and a qualified archeologist retained to examine the find and recommend mitigations as necessary.


Subject Area
SALT EVAPORATORS
SLOUGH
Alviso
Gaging Sta
BM 4
BM 5
BM 3
Mayne Sch
Pumping Sta
SAN JOSE ALVISO
Guadalupe
SUNNYVALE CITY
SEA LEVEL
SAN JOSE BOUNDARY
CITY BOUNDARY
BDY
CITY
COFFIN
ROAD
EMBARCADERO DE SANTA CLARA
SOUTHERN PACIFIC
ULISTAC
SANTA CLARA
PASTORIA DE LAS BORREGAS
AQUEDUCT
PRESCOTT AVE
LAKE AVE
Fairwood Sch
SANDIA AVE
FAIRWOOD
EXPRESSWAY
Creek
Calabazas
AGNEW
Agnew Sch
Hughes Sch
BAYSHORE 3 LANE FREEWAY
SUNNYVALE
LAWRENCE
Saratoga
Aguanas
CENTRAL EXPRESSWAY
SUNNYVALE SANTA CLARA
ARQUES ROAD
MOUNTAIN VIEW 5 MI
MOFFETT FIELD 3.2 MI
SAN FRANCISCO 40 MI
PALO ALTO 9.6 MI
4143
4142
4140
4138
4137
25'
330 000 FEET
T 6 S
15-48

HARVEY & STANLEY ASSOCIATES, INC.
Ecological Consultants

# ECOLOGICAL BASELINE STUDY OF ALVISO REACH OF THE GUADALUPE RIVER, SAN JOSE, CALIFORNIA

Prepared by

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## INTRODUCTION

The area investigated is adjacent to the Guadalupe River from the Alviso Marina to the Southern Pacific Railroad tracks in Santa Clara County, California (Figure 1). The nature of the vegetation along the east bank of the river was investigated with particular attention being paid to wetland indicator species. Of the five areas investigated within the project site, three were found to be of potential value to marsh wildlife. In addition, the potential for restoring an area of upland fill to tidally-influenced wetland was determined favorable.

## PLANT METHODOLOGY

Initial evaluation of the study area revealed that the area could be divided into five sub-areas based upon the type and complexity of vegetation in each. These five areas, labeled A-E, are illustrated in Figure 1. Two of these areas, D and E, consisted of vegetation simple enough in composition so as not to require quantitative analysis. Areas A, B and C, however, were observed to consist of vegetation complex enough to warrant quadrat sampling.

To facilitate the evaluation of vegetation along the levee, a baseline was established along the top of the levee from the Alviso Marina to the Southern Pacific Railroad tracks (Figure 1). The baseline follows the (Alternative B) proposed location of the new levee, thus disjoining the area west of the marina.

The compass bearing and length of each segment of the baseline are listed in Table 1.

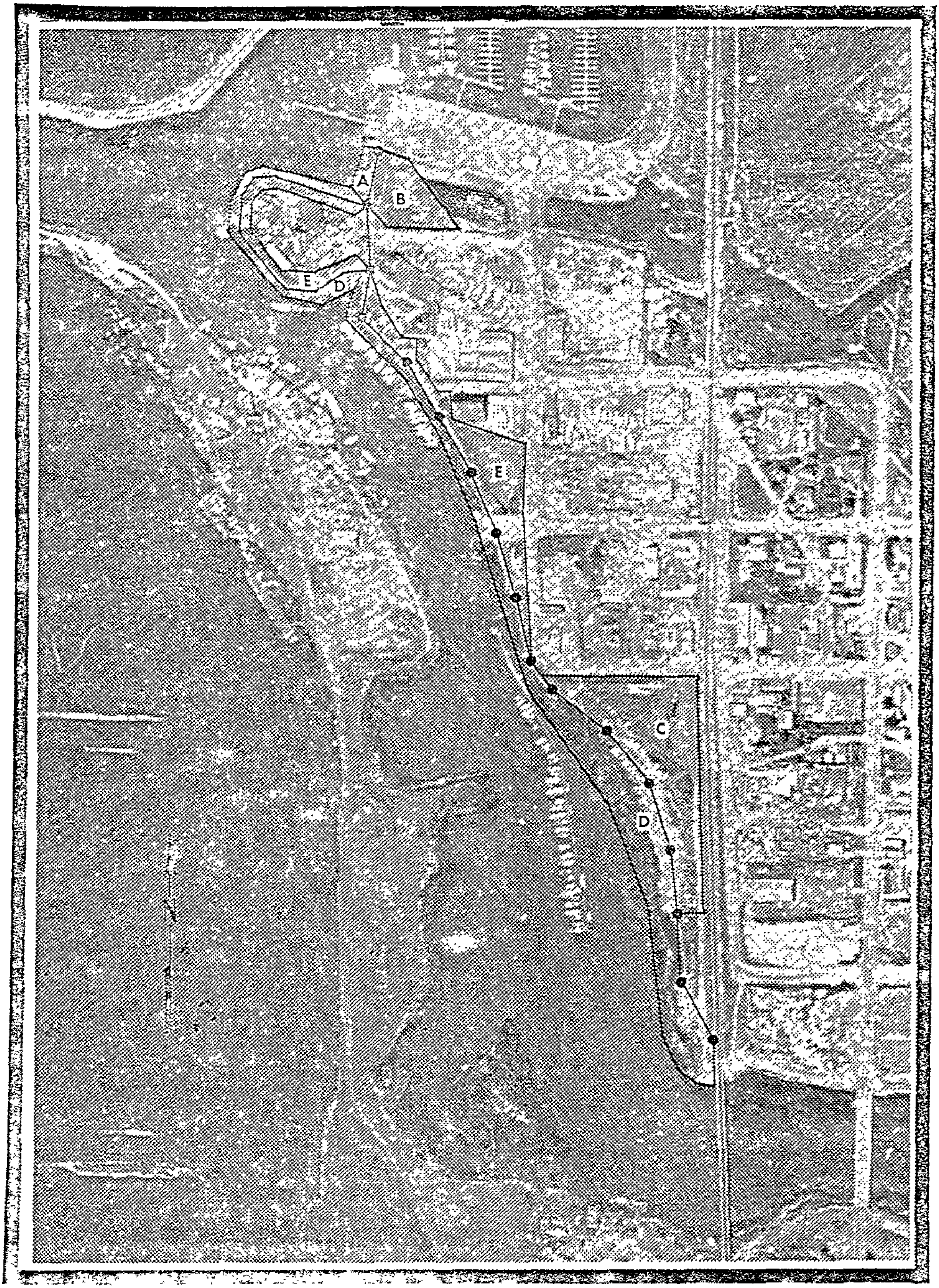

Figure 1. Location of baseline and study areas on Guadalupe River levee, Santa Clara County, California.

Table I. Compass bearings and lengths of baseline segments.

| Segment Number | Length (meters) | Compass Bearing (degrees east of magnetic north) |
|---|---|---|
| 1 | 40 | 174 |
| 2 | 50 | 158 |
| 3 | 40 | 170 |
| 4 | 50 | 122 |
| 5 | 50 | 136 |
| 6 | 50 | 136 |
| 7 | 50 | 140 |
| 8 | 50 | 146 |
| 9 | 50 | 150 |
| 10 | 30 | 136 |
| 11 | 50 | 106 |
| 12 | 50 | 116 |
| 13 | 50 | 146 |
| 14 | 50 | 150 |
| 15 | 50 | 154 |
| 16 | 50 | 136 |

Total baseline length: 760 meters

In areas where quadrat sampling was to be used (areas A, B and C) transects were established perpendicular to the baseline at 10 meter intervals. One square meter (1.0m$^2$) quadrats were sampled for percent cover beginning at the baseline. Sampling continued at 2 meter intervals along the entire length of the transect. In all cases, quadrats were established over the center of the transect line. In area D and E, estimates of cover and determination of species composition and stratification were made by direct observation.

Percent cover and frequency values were calculated for each species encountered in each of the three areas where quadrat sampling was carried out.

## WILDLIFE USE ASSESSMENT

Inasmuch as the main offices of Harvey and Stanley Associates are in Alviso, the senior author has observed wildlife use of the area in question over the last five years. Dr. Harvey has walked the dike on repeated occasions (40-50 times) during that time. Dr. Shellhammer made an on site inspection Nov. 19, 1982 in regard to endangered species.

## HABITAT RESULTS

The data obtained from the three areas where quadrat sampling was carried out follows. In addition, the composition of the vegetation has been described for the two areas where quadrat sampling was not required. Most of the plants have been identified to species, a few, however, only to genus (see Appendix A). Six species of grasses have been lumped into the category "ruderal grasses" inasmuch as they are foreign and not good indicators of wetlands. Determination of wetland indicator species was based largely upon the ratings of the U.S. Fish and Wildlife Service (1981).

At Area A ruderal grasses and alkali bulrush (*Scirpus robustus*) dominated the cover as well as frequency (Table II). The value for bare ground was also high due largely to exposed mud during low tide and bare areas near the top of the levees. Upland species, including the ruderal grasses, were found exclusively on the upper edge of the levee whereas the wetland species, including bulrush and pickleweed (*Salicornia pacifica*) pre-dominated along the lower edge of the levee and onto the mud flats. Although cordgrass (*Spartina foliasa*) was not found within the sample plots it was conspicuous at the lowest levels of the marsh.

Wildlife uses included saltmarsh song sparrow, American coot, white-crowned sparrow, golden-crowned sparrow and cliff swallows feeding on insects over the levee slope. Mammals included ground squirrels, meadow mice and probably various microtine rodents.

As far as endangered species are concerned, clapper rails may on occasion utilize this modest expanse of tidal marsh. It is not likely that salt marsh harvest mice occur in the area, according to Dr. Shellhammer, and the occurrences of California least tern, brown pelican and perigrine falcon are very infrequent.

Table II. Area A vegetation showing cover and frequency of plant species in 37 sample plots.

| Species | % Cover | Frequency |
|---|---|---|
| *Scirpus robustus* | 26.8 | .38 |
| Grasses, ruderal | 25.9 | .43 |
| *Grindelia humilis* | 6.2 | .11 |
| *Cakile maritima* | 2.8 | .11 |
| *Lepidium latifolium* | 2.6 | .11 |
| *Atriplex patula* | 1.9 | .08 |
| *Beta vulgaris* | 1.4 | .11 |
| *Salicornia pacifica* | 0.8 | .05 |
| *Jaumea carnosa* | 0.8 | .03 |
| *Bassia hyssopifolia* | 0.7 | .03 |
| *Spergularia marina* | 0.5 | .05 |
| *Malva* sp. | 0.3 | .03 |
| *Rumex crispus* | 0.3 | .03 |
| *Convolvulus* sp. | 0.1 | .05 |
| Bare ground | 28.9 | .62 |

At Area B, ruderal grasses made up neary 50 percent of the cover. Wetland indicators such as pickleweed (*Salicornia pacifica*) totaled less than 5 percent of the total cover (Table

III). These data indicate that this area is not predominately covered with wetland vegetation.

Due to the upland characteristics of this area's vegetation common wildlife species are: house finch, white-crowned sparrow, golden-crowned sparrow, American goldfinch, Brewer's blackbird, and western meadowlark. Ground squirrels and microtine rodents are also common to this area. There is little likelihood that any endangered species utilize the area.

Table III. Area B vegetation showing cover and frequency of plant species in 106 sample plots.

| Species | % Cover | Frequency |
|---|---|---|
| Grasses, ruderal | 49.4 | .89 |
| *Picris echioides* | 4.3 | .25 |
| *Brassica* sp. | 3.5 | .20 |
| *Salicornia pacifica* | 2.9 | .08 |
| *Foeniculum vulgare* | 2.8 | .08 |
| *Malva* sp. | 2.2 | .14 |
| *Cakile maritima* | 1.4 | .07 |
| *Tanacetum* sp. | 1.1 | .09 |
| *Grindelia humilis* | 0.6 | .02 |
| *Trifolium* sp. | 0.6 | .07 |
| *Convolvulus* sp. | 0.4 | .07 |
| *Beta vulgaris* | 0.3 | .02 |
| *Rumex crispus* | 0.2 | .03 |
| *Bassia hyssopifolia* | 0.1 | .01 |
| Bare ground | 30.2 | .81 |

The data from the sample plots in Area C indicate a wetland species cover of more than 15 percent (Table IV). Pickleweed (*Salicornia pacifica*), an obligate wetland species, accounted for 8.5 percent of the total cover alone. Although ruderal grasses account for the greatest cover in this area, these data suggest that this area may serve as a habitat for some marsh wildlife. On site inspection by Dr. H. S. Shellhammer, however, led him to conclude that it was not favorable habitat for the salt marsh harvest mouse. The general wildlife use is similar to Area B as discussed above. The alternative alignments as shown for this reach of the river would both encroach on this area. The realignment which increases tidal area would on balance produce improved wildlife use.

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Table IV. Area C vegetation showing cover and frequency of plant species in 247 sample plots.

| Species | % Cover | Frequency |
|---|---|---|
| Grasses | 41.0 | .73 |
| *Salicornia pacifica* | 8.5 | .30 |
| *Atriplex semibaccata* | 5.5 | .18 |
| Unknown No. 1 | 5.4 | .07 |
| *Malva* sp. | 3.8 | .14 |
| *Distichlis spicata* | 3.5 | .06 |
| *Beta vulgaris* | 2.9 | .17 |
| *Frankenia grandifolia* | 1.4 | .03 |
| *Salsola soda* | 1.4 | .03 |
| *Bassia hyssopifolia* | 1.0 | .06 |
| Unknown No. 2 | 0.8 | .01 |
| *Atriplex patula* | 0.5 | .04 |
| *Picris echioides* | 0.5 | .03 |
| *Convolvulus* sp. | 0.3 | .02 |
| *Cakile maritima* | 0.2 | .01 |
| *Rumex crispus* | 0.1 | .01 |
| *Jaumea carnosa* | 0.1 | .01 |
| Bare ground | 23.1 | .55 |

Area D consisted of two general zones: the sloping banks of the levee and the mud flats at the base of the levee. The levee bank was covered with a mix of upland and wetland indicator species. These included sweet fenuel (Foeniculum vulgare), peppergrass (Lepidium latifolium), Gumplant (grindelia humilis), Mallow (Malva sp.) and fat hen (Atriplex patula). The tidal flats were vegetated by bulrush (Scirpus robustus). This obligate wetland species was estimated to cover more than 50 percent of Area D.

The wildlife uses of this area are extensive. Many species of shorebirds and waterfowl have been observed (over 50 species). Although not a likely habitat for the salt marsh harvest mouse, the rails (clapper and black) probably use the site. The peregrine falcon may on rare occasions hunt for shorebirds.

Area E was a highly disturbed area consisting almost exclusively of upland species. Ruderal grasses were estimated to cover more than 50 percent of the area. Other species observed included sweet fennel (Foeniculum vulgare), mallow (Malva sp.), wild beet (Beta vulgaris), mustard (Brassica sp.), oxtongue (Picris echioides) and gumplant (Grindelia humilis).

Upland wildlife uses this area to a modest degree as it is surrounded by considerable human activity. People walk/drive on the present dike, a portion is an active garden and two streets are immediately adjacent to the area. The types of organisms present are those listed for Area B.

## CONCLUSIONS

On the basis of vegetation cover, Areas B and E would not be considered wetland and support moderate levels of wildlife. These areas would also have limited value in providing habitat for endangered species in the area, e.g. (California clapper rail, salt marsh harvest mouse). Areas A, D, and C to a lesser extent; however, have considerable wetland species cover, thus providing potential habitat for wildlife species.

The potential for restoring the upland fill area near the Southern Pacific Railroad tracks (Area C) to tidally-influenced wetland would be favorable. Removing fill to bring the area to the proper elevation would provide additional wetland, possibly offsetting any loss of habitat in Area C that currently supports wildlife.

# APPENDIX A

## Plant List for Guadalupe River Levee

| Scientific Name | Common Name | A | B | C | D | E |
|---|---|---|---|---|---|---|
| *Atriplex patula* | Fat hen | X |  | X | X |  |
| *Atriplex semibaccata* | Austrailian Saltbush |  |  | X | X |  |
| *Avena fatua* | Wild Oat |  | X |  |  | X |
| *Bassia hyssopifolia* | Bassia | X | X | X | X |  |
| *Beta vulgaris* | Wild beet | X | X | X |  | X |
| *Brassica* sp. | Mustard |  | X |  |  | X |
| *Bromus rigidus* | Ripgut |  | X | X |  | X |
| *Cakile maritima* | Sea-rocket | X | X | X |  |  |
| *Convolvulus* sp. | Morning glory | X | X | X |  |  |
| *Distichlis spicata* | Salt grass |  |  | X |  |  |
| *Foeniculum vulgare* | Sweet fennel |  | X |  | X | X |
| *Frankenia grandifolia* | Alkali heath |  |  | X | X |  |
| *Grindelia humilis* | Gum plant | X | X |  | X | X |
| *Hordeum hystrix* | Foxtail |  | X | X |  | X |
| *Jaumea carnosa* | Jaumea | X |  | X | X |  |
| *Malva* sp. | Mallow | X | X | X |  | X |
| *Lepidium latifolium* | Peppergrass | X |  |  | X |  |
| *Lolium perenne* | Ryegrass |  | X | X |  | X |
| *Oryzopsis miliacea* | Ricegrass |  | X | X |  | X |
| *Picris echioides* | Ox tongue |  | X | X |  | X |
| *Polypogon monspeliensis* | Rabbitsfoot grass | X | X | X |  | X |
| *Rumex crispus* | Curly dock | X | X | X |  | X |
| *Salicornia pacifica* | Pickleweed | X | X | X | X |  |
| *Salsola soda* | Tumbleweed |  |  | X |  |  |
| *Scirpus robustus* | Bulrush | X |  |  | X |  |
| *Spergularia marina* | Sand spurry | X |  |  | X |  |
| *Tanacetum* sp. | Tansey |  | X |  |  |  |
| *Trifolium* sp. | Clover |  | X |  |  |  |
| Unknown No. 1 |  |  |  | X |  |  |
| Unknown No. 2 |  |  |  | X |  |  |

# REFERENCES

U.S. Fish and Wildlife Service. 1981. Wetland plants data set manual. Mimeo.

# APPENDIX A

# PERSONS TO CONTACT FOR MORE INFORMATION

## PERSONS TO CONTACT FOR MORE INFORMATION

### About this Report

David M. McNeely or Iwao Shintani
Santa Clara Valley Water District
(408) 265-2600, extension 316 or 314

### About Flood Insurance

Randy Talley
Santa Clara Valley Water District
(408) 265-2600, extension 303

### About Environmental Consideration

Dr. Bernard Goldner
Santa Clara Valley Water District
(408) 265-2600, extension 350

### About Creek Maintenance

Donald Erling
Santa Clara Valley Water District
(408) 265-2600, extension 360

### About Right of Way Acquisitions

Donald Lawrie
Santa Clara Valley Water District
(408) 265-2600, extension 261

# APPENDIX B

# BASIS FOR ELEVATIONS

# BASIS FOR ELEVATIONS

Information on tides and datums was gathered from various sources and references, particularly an in-house District memorandum dated May 21, 1980 from Randy Talley to Richard Pardini. The basic vertical datum for mapping purposes in California is the 1929 National Geodetic Vertical Datum (NGVD). It is constant throughout the country. Tides are measured from Mean Lower Low Water (MLLW) which is the mean of historic lower low water elevations at the point in question. Therefore, the elevation of MLLW (referenced to NGVD) varies from point to point. At the Golden Gate, MLLW is 2.86 feet below NGVD. At Alviso MLLW is 4.7 feet below NGVD. Therefore, the actual difference in elevation between MLLW at the Golden Gate Bridge and MLLW at Alviso is 1.8± ft.

The readily available San Francisco Bay tide tables give the predicted times of day and heights of tides above MLLW at the Golden Gate. A table of adjustments is used to convert these to values at other points around the bay. For Alviso the adjustments to convert times of day and heights of tides above MLLW at the Golden Gate to times of day and heights of tides above MLLW at Alviso are:

High Water - Add 1 Hour, 20 minutes and 3.3 feet
Low Water - Add 2 Hours, 18 minutes and 0.1 foot

Since each navigation chart sounding is referenced to MLLW at that particular point, the adjusted predicted height above (or below) MLLW is added to (or subtracted from) the sounding on the chart to calculate the predicted depth at high or low water, as the case may be.

To convert the predicted tide level to NGVD it is necessary to know the difference between NGVD and MLLW at that point. The following conversions for Alviso are based on MLLW at Alviso being 4.7 feet below NGVD.

| | Datum | |
|---|---|---|
| | MLLW | 1929 NGVD |
| Highest Expected Tide (HET) | +11.9 | +7.2 |
| Mean Higher High Water (MHHW) | +9.0 | +4.3 |
| Mean Sea Level (MSL) | +5.0 | +0.3 |
| 1929 NGVD | +4.7 | 0.0 |
| Mean Lower Low Water (MLLW) | 0.0 | -4.7 |
| Lowest Expected Tide (LET) | -2.5 | -7.2 |

Times and tide heights in tide table books are predicted on the basis of astronomical effects only - meteorological effects are assumed to be "neutral". Times and tide heights at Alviso will vary from those predicted due to significant quantities of water flowing down Guadalupe River and raising its level, significant quantities of water flowing into the bay and raising its level, northwesterly winds raising (or southeasterly winds lowering) the level of the south bay, and low atmospheric pressure raising (or high pressure lowering) bay water levels. Unfortunately, all of those conditions which can raise Alviso water levels can, and sometimes do occur at the same time. Even worse, in most years the highest predicted tide heights (astronomical basis) occur in December and January when such meteorological conditions are most likely.

# APPENDIX C

# THE ONE PERCENT FLOOD

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The one percent flood is that flow of water from a drainage area that has a one percent chance (probability of 0.01) of occuring in any given year. It is equivalent to the so-called 100 year flood, but it should not be thought of as an event that occurs regularly every 100th year. Instead, it is the flood flow event that would be equaled or exceeded about 100 times in 10,000 years. It is also possible that two repetitions of this flood flow could occur in a single year, or that a single event may not occur even once in 200 years.

The "one percent flood" is the preferred description of the design flood. However, the term "100-year flood" is equivalent. Unfortunately, this latter term often leads to the misconception that the design flood occurs only every 100th year.

Another terminology problem is the relation of the one percent storm and the one percent flood. The storm magnitude relates to flood magnitude through a complex set of parameters such as antecedent rainfall conditions, drainage basin shape, length, slope, orientation and others. Therefore, a one percent storm will not necessarily produce a one percent flood. The one percent flood should not be confused with nor should it be referred to as the one percent storm flood.

The one percent flood has a small risk of occurence in a given year, but this risk is accumulative. When compared with the 30-year life of the average home loan, for example, the chance that it will occur is quite large. During the 30-year loan period, the chance that a one percent flood will occur, or be exceeded, approaches 30 percent.

The magnitude of the one percent flood must be calculated using statistical hydrological (stochastic) methods. Since it is the desire of the District to provide equal protection from flooding to all residents, a uniform method of determining design flood flows is required; one that is regional in scope and one that minimizes the chance of providing unequal protection from one area to another. This objective is reached through a regional peak flood frequency analysis that uses the best available hydrologic data from stream systems in and adjacent to the District. The regional process utilized by the District was developed after considerable effort and has been reviewed and approved by the academic and professional community.

The research on the statistical measurement of flood flows and frequencies has shown that the larger magnitude floods that occur at relatively infrequent intervals, such as the one percent flood, are products of extremely heavy rainfalls, either exceptionally high intensity or of long duration. With exceptionally high-intensity rainfall, so much rain falls in a short period of time that no matter what the ground cover is - soil, pavement, grass, trees, or buildings - the water cannot be stored or soaked up, and it runs off in a flood. With long-duration rainfall, a lot of rain falls, but it comes over a long period of time. Bare soil, grassland, forests, landscaping, house roofs and pavement become fully saturated, and flooding occurs when no more water can be absorbed, stored or evaporated. Thus, for large floods, the type of development or degree of urbanization that exists in the total watershed has essentially no effect on the magnitude of the peak flow that is generated.

However, the situation is different for the small magnitude floods which occur at frequent intervals. In these, the rainfall intensity is less or of shorter duration. The absorption, holding or storage characteristics of the land are much more important. With much less water present, soil, grass and forests tend to soak up and hold back the rain that falls, while pavement and house roofs let a large percentage run off.

Therefore, when grassland is converted to pavement, the amount of water that runs off is much greater for the small amounts of rainfall. The magnitude of the small, more frequent type of flood flow is increased by urbanization.

In discussing flood flows and urbanization, there is one additional factor that should be mentioned. This is overbank storage in floodplain areas. Where urbanization occurs in the floodplain and the stream is channelized, the storage of overbank floodwaters is reduced. This results in greater downstream flood flows. This increase in flood flows occurs for any magnitude or frequency of flooding that would have resulted in channel overflow and storage of waters in the floodplain.

Lloyd C. Fowler

October 21, 1974

# APPENDIX D

# COST SUMMARY OF ALTERNATIVES

# SUMMARY

| ALT | | REACH 1 | REACH 2 | REACH 3 | REACH 4 | REACH 5 | TOTAL |
|---|---|---|---|---|---|---|---|
| A | *CONST. | $191,000 | $205,600 | $142,500 | $574,700 | $103,000 | $1,216,800 |
| | *R.O.W. | 145,000 | 40,000 | 20,000 | 5,000 | 2,000 | 212,000 |
| | *ENG. | 34,000 | 37,400 | 25,500 | 103,300 | 19,000 | 219,200 |
| | TOTAL | $370,000 | $283,000 | $188,000 | $683,000 | $124,000 | $1,648,000 |
| A1 | CONST. | $191,000 | $205,600 | $142,500 | $245,100 | $103,000 | $ 887,200 |
| | R.O.W. | 145,000 | 40,000 | 20,000 | 35,000 | 2,000 | 242,000 |
| | ENG. | 34,000 | 37,400 | 25,500 | 43,900 | 19,000 | 159,800 |
| | TOTAL | $370,000 | $283,000 | $188,000 | $324,000 | $124,000 | $1,289,000 |
| B | CONST. | $ 82,800 | $205,600 | $142,500 | $574,700 | $103,000 | $1,108,600 |
| | R.O.W. | 50,000 | 40,000 | 20,000 | 5,000 | 2,000 | 117,000 |
| | ENG. | 15,200 | 37,400 | 25,500 | 103,300 | 19,000 | 200,400 |
| | TOTAL | $148,000 | $283,000 | $188,000 | $683,000 | $124,000 | $1,426,000 |
| B1 | CONST. | $ 82,800 | $205,600 | $142,500 | $245,100 | $103,000 | $ 779,000 |
| | R.O.W. | 50,000 | 40,000 | 20,000 | 35,000 | 2,000 | 147,000 |
| | ENG. | 15,200 | 37,400 | 25,500 | 43,900 | 19,000 | 141,000 |
| | TOTAL | $148,000 | $283,000 | $188,000 | $324,000 | $124,000 | $1,067,000 |
| C | CONST. | $191,000 | $134,900 | $142,500 | $574,700 | $103,000 | $1,146,100 |
| | R.O.W. | 145,000 | 105,000 | 20,000 | 5,000 | 2,000 | 277,000 |
| | ENG. | 34,000 | 24,100 | 25,500 | 103,300 | 19,000 | 205,900 |
| | TOTAL | $370,000 | $264,000 | $188,000 | $683,000 | $124,000 | $1,629,000 |
| C1 | CONST. | $191,000 | $134,900 | $142,500 | $245,100 | $103,000 | $ 816,500 |
| | R.O.W. | 145,000 | 105,000 | 20,000 | 35,000 | 2,000 | 307,000 |
| | ENG. | 34,000 | 24,100 | 25,500 | 43,900 | 19,000 | 146,500 |
| | TOTAL | $370,000 | $264,000 | $188,000 | $324,000 | $124,000 | $1,270,000 |
| D | CONST. | $ 82,800 | $134,900 | $142,500 | $245,100 | $254,800 | $ 860,100 |
| | R.O.W. | 50,000 | 105,000 | 20,000 | 35,000 | 20,000 | 230,000 |
| | ENG. | 15,200 | 24,100 | 25,500 | 43,900 | 46,200 | 154,900 |
| | TOTAL | $148,000 | $264,000 | $188,000 | $324,000 | $321,000 | $1,245,000 |
| D1 | CONST. | $ 82,800 | $179,500 | $142,500 | $245,100 | $103,000 | $ 752,900 |
| | R.O.W. | 50,000 | 45,000 | 20,000 | 35,000 | 2,000 | 152,000 |
| | ENG. | 15,200 | 32,500 | 25,500 | 43,900 | 19,000 | 136,100 |
| | TOTAL | $148,000 | $257,000 | $188,000 | $324,000 | $124,000 | $1,041,000 |
| E | CONST. | $479,600 | $292,400 | $269,000 | $251,700 | $547,400 | $1,840,100 |
| | R.O.W. | 50,000 | 20,000 | 5,000 | 5,000 | 0 | 80,000 |
| | ENG. | 86,400 | 52,600 | 48,000 | 45,300 | 98,600 | 330,900 |
| | TOTAL | $616,000 | $365,000 | $322,000 | $302,000 | $646,000 | $2,251,000 |
| F | CONST. | $1,228,900 | $742,100 | $512,700 | $679,600 | $2,285,800 | $5,449,100 |
| | R.O.W. | 145,000 | 40,000 | 20,000 | 35,000 | 2,000 | 242,000 |
| | ENG. | 221,100 | 133,900 | 92,300 | 122,400 | 411,200 | 980,900 |
| | TOTAL | $1,595,000 | $916,000 | $625,000 | $837,000 | $2,699,000 | $6,672,000 |

*CONST. = Construction Cost
R.O.W. = Right of Way Cost
ENG. = Engineering and Administration Cost

ALTERNATIVE IMPROVEMENT A, A1, C, C1

REACH 1

STATION 995+57 TO STATION 998+55

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Clearing & Grubbing | 1.2 Acre | 2,000/Acre | 2,400 |
| Earthwork | | | |
| Embankment | 12,480 CY | 8.00/CY | 99,800 |
| Excavation | 3,260 CY | 6.00/CY | 19,600 |
| Structural Concrete | 50 CY | 400/CY | 20,000 |
| Riprap | 200 CY | 20/CY | 4,000 |
| Slope Seeding | 0.8 Acre | 2,000/Acre | 1,600 |
| Access Stairway | 110 LF | 170/LF | 18,700 |

| | |
|---|---|
| Subtotal | 166,100 |
| Mobilization (5%) | 8,300 |
| Construction Contingencies (10%) | 16,600 |
| Total Construction Cost | $191,000 |
| Engineering Design, Administration and Overhead (18%) | 34,000 |
| Right of Way Cost | 145,000 |
| Total Cost | $370,000 |

## ALTERNATIVE IMPROVEMENT A, A1, B, B1

## REACH 2

## STATION 998+55 TO STATION 1003+95

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Clearing & Grubbing | 0.2 Acre | 2,000/Acre | 400 |
| Dewatering | | L.S. | 5,000 |
| Earthwork | | | |
| Embankment | 4,490 CY | 8.00/CY | 35,900 |
| Excavation | 2,850 CY | 6.00/CY | 17,100 |
| Structural Concrete | 275 CY | 400/CY | 110,000 |
| Slope Seeding | 0.1 Acre | 2,000/Acre | 200 |
| Access Stairway | 60 LF | 170/LF | 10,200 |
| | | Subtotal | 178,800 |
| | | Mobilization (5%) | 8,900 |
| | | Construction Contingencies (10%) | 17,900 |
| | | Total Construction Cost | $205,600 |
| | | Engineering Design, Administration and Overhead (18%) | 37,400 |
| | | Right of Way Cost | 40,000 |
| | | Total Cost | $283,000 |

ALTERNATIVE IMPROVEMENT A, A1, B, B1, C, C1, D, D1

REACH 3

STATION 1003+95 TO STATION 1007+20

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Clearing & Grubbing | 0.4 Acre | 2,000/Acre | 800 |
| Utility Relocation | | L.S. | 10,600 |
| Pump Station Relocation | | L.S. | 20,000 |
| Drainage | | | |
| Drain Rock | 73 CY | 15/CY | 1,100 |
| 6" CMP laterals | 520 LF | 6.50/LF | 3,400 |
| 12" RCP collector | 315 LF | 20/LF | 6,300 |
| Earthwork | | | |
| Embankment | 8,920 CY | 8.00/CY | 71,400 |
| Excavation | 800 CY | 6.00/CY | 4,800 |
| Slope Seeding | 0.2 Acre | 2,000/Acre | 400 |
| Access Stairway | 30 LF | 170/LF | 5,100 |
| | | Subtotal | 123,900 |
| | | Mobilization (5%) | 6,200 |
| | | Construction Contingencies (10%) | 12,400 |
| | | Total Construction Cost | $142,500 |
| | | Engineering Design, Administration and Overhead (18%) | 25,500 |
| | | Right of Way Cost | 20,000 |
| | | Total Cost | $188,000 |

## ALTERNATIVE IMPROVEMENT A, B, C

## REACH 4

## STATION 1007+20 TO STATION 1010+90

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Clearing & Grubbing | 0.2 Acre | 2,000/Acre | 400 |
| Roadway Removal | 1,020 SY | 1.50/SY | 1,500 |
| Utility Relocation | | L.S. | 24,000 |
| Dewatering | | L.S. | 6,500 |
| Shoring & Sheeting | | L.S. | 92,300 |
| Drainage | | | |
| Drain Rock | 70 CY | 15/CY | 1,100 |
| Earthwork | | | |
| Embankment | 2,790 CY | 8.00/CY | 22,300 |
| Excavation | 2,210 CY | 6.00/CY | 13,300 |
| Structural Concrete | 680 CY | 400/CY | 272,000 |
| Drilled Piers | 1,040 VLF | 30/VLF | 31,200 |
| Roadway Replacement | | | |
| 12: Class II Agg. Base | 1,320 SY | 4.50/SY | 5,900 |
| 3" Asphalt Concrete | 1,240 SY | 5.75/SY | 7,100 |
| Slope Seeding | 0.1 Acre | 2,000/Acre | 200 |
| Access Stairway | 80 LF | 170/LF | 13,600 |
| Handrail | 330 LF | 25/LF | 8,300 |
| | | Subtotal | 499,700 |
| | | Mobilization (5%) | 25,000 |
| | | Construction Contingencies (10%) | 50,000 |
| | | Total Construction Cost | $574,700 |
| | | Engineering Design, Administration and Overhead (18%) | 103,300 |
| | | Right of Way Cost | 5,000 |
| | | Total Cost | $683,000 |

ALTERNATIVE IMPROVEMENT A, A1, B, B1, C, C1, D1

REACH 5

STATION 1010+90 TO STATION 1021+42

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Clearing & Grubbing | 1.3 Acre | 2,000/Acre | 2,600 |
| Earthwork | | | |
| Embankment | 8,700 CY | 8.00/CY | 69,600 |
| Excavation | 2,610 CY | 6.00/CY | 15,700 |
| Slope Seeding | 0.8 Acre | 2,000/Acre | 1,600 |
| | | Subtotal | 89,500 |
| | | Mobilization (5%) | 4,500 |
| | | Construction Contingencies (10%) | 9,000 |
| | | Total Construction Cost | $103,000 |
| | | Engineering Design, Administration and Overhead (18%) | 19,000 |
| | | Right of Way Cost | 2,000 |
| | | Total Cost | $124,000 |

ALTERNATIVE IMPROVEMENT A1, B1, C1, D, D1

REACH 4

STATION 1007+20 TO STATION 1010+90

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Clearing & Grubbing | 0.6 Acre | 2,000/Acre | 1,200 |
| Roadway Removal | 2,500 SY | 1.50/SY | 3,800 |
| Moving Existing South Bay Yacht Club | | L.S. | 44,000 |
| Utility Relocation | | L.S. | 29,000 |
| Drainage | | | |
| Drain Rock | 27 CY | 15/CY | 400 |
| 6" CMP laterals | 200 LF | 6.50/LF | 1,300 |
| 12" RCP collector | 120 LF | 20/LF | 2,400 |
| Earthwork | | | |
| Embankment | 9,790 CY | 8.00/CY | 78,300 |
| Excavation | 980 CY | 6.00/CY | 5,900 |
| Roadway Replacement | | | |
| 12" Class II Agg. Base | 3,200 SY | 4.50/SY | 14,400 |
| 3" Asphalt Concrete | 3,100 SY | 5.75/SY | 17,800 |
| Slope Seeding | 0.5 Acre | 2,000/Acre | 1,000 |
| Access Stairway | 80 LF | 170/LF | 13,600 |
| | | Subtotal | 213,100 |
| | | Mobilization (5%) | 10,700 |
| | | Construction Contingencies (10%) | 21,300 |
| | | Total Construction Cost | $245,100 |
| | | Engineering Design, Administration and Overhead (18%) | 43,900 |
| | | Right of Way Cost | 35,000 |
| | | Total Cost | $324,000 |

ALTERNATIVE IMPROVEMENT B, B1, D, D1

REACH 1

STATION 995+57 TO STATION 998+55

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Clearing & Grubbing | 0.6 Acre | 2,000/Acre | 1,200 |
| Earthwork | | | |
| Embankment | 6,420 CY | 8.00/CY | 51,400 |
| Excavation | 1,120 CY | 6.00/CY | 6,700 |
| Slope Seeding | 0.4 Acre | 2,000/Acre | 800 |
| Access Stairway | 70 LF | 170/LF | 11,900 |
| | | Subtotal | 72,000 |
| | | Mobilization (5%) | 3,600 |
| | | Construction Contingencies (10%) | 7,200 |
| | | Total Construction Cost | $ 82,800 |
| | | Engineering Design, Administration and Overhead (18%) | 15,200 |
| | | Right of Way Cost | 50,000 |
| | | Total Cost | $148,000 |

ALTERNATIVE IMPROVEMENT C, C1, D

REACH 2

STATION 998+55 TO STATION 1003+95

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Clearing & Grubbing | 0.5 Acre | 2,000/Acre | 1,000 |
| Removal of Existing Building | | L.S. | 18,000 |
| Prepare Existing Buildings for Embankment | | L.S. | 7,000 |
| Drainage | | | |
| Drain Rock | 118 CY | 15/CY | 1,800 |
| 6" CMP laterals | 880 LF | 6.50/LF | 5,700 |
| 12" RCP collector | 530 LF | 20/LF | 10,600 |
| Earthwork | | | |
| Embankment | 6,200 CY | 8.00/CY | 49,600 |
| Hand Placed Embankment | 210 CY | 20/CY | 4,200 |
| Excavation | 1,300 CY | 6.00/CY | 7,800 |
| Slope Seeding | 0.7 Acre | 2,000/Acre | 1,400 |
| Access Stairway | 60 LF | 170/LF | 10,200 |
| | | Subtotal | 117,300 |
| | | Mobilization (5%) | 5,900 |
| | | Construction Contingencies (10%) | 11,700 |
| | | Total Construction Cost | $134,900 |
| | | Engineering Design, Administration and Overhead (18%) | 24,100 |
| | | Right of Way Cost | 105,000 |
| | | Total Cost | $264,000 |

## ALTERNATIVE IMPROVEMENT D1

## REACH 2

## STATION 998+55 TO STATION 1003+95

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Clearing & Grubbing | 0.4 Acre | 2,000/Acre | 800 |
| Dewatering |  | L.S. | 5,000 |
| Shoring & Sheeting |  | L.S. | 5,300 |
| Drainage |  |  |  |
| Drain Rock | 70 CY | 15/CY | 1,100 |
| 6" CMP laterals | 480 LF | 6.50/LF | 3,100 |
| 12" RCP collector | 300 LF | 20/LF | 6,000 |
| Earthwork |  |  |  |
| Embankment | 4,790 CY | 8.00/CY | 38,300 |
| Excavation | 1,980 CY | 6.00/CY | 11,900 |
| Structural Concrete | 185 CY | 400/CY | 74,000 |
| Slope Seeding | 0.2 Acre | 2,000/Acre | 400 |
| Access Stairway | 60 LF | 170/LF | 10,200 |
| Subtotal |  |  | 156,100 |
| Mobilization (5%) |  |  | 7,800 |
| Construction Contingencies (10%) |  |  | 15,600 |
| Total Construction Cost |  |  | $179,500 |
| Engineering Design, Administration and Overhead (18%) |  |  | 32,500 |
| Right of Way Cost |  |  | 45,000 |
| Total Cost |  |  | $257,000 |

## ALTERNATIVE IMPROVEMENT D

## REACH 5

## STATION 1010+90 TO STATION 1021+42

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Clearing & Grubbing | 2.3 Acre | 2,000/Acre | 4,600 |
| Removal of Fencing | 170 LF | 1.50/LF | 300 |
| Earthwork | | | |
| Embankment | 24,980 CY | 8.00/CY | 199,800 |
| Excavation | 2,270 CY | 6.00/CY | 13,600 |
| Slope Seeding | 1.6 Acre | 2,000/Acre | 3,200 |
| Subtotal | | | 221,500 |
| Mobilization (5%) | | | 11,100 |
| Construction Contingencies (10%) | | | 22,200 |
| Total Construction Cost | | | $254,800 |
| Engineering Design, Administration and Overhead (18%) | | | 46,200 |
| Right of Way Cost | | | 20,000 |
| Total Cost | | | $321,000 |

## ALTERNATIVE IMPROVEMENT E

### REACH 1

### STATION 995+57 TO STATION 998+55

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Earthwork | | | |
| Pre-excavation | 298 LF | 15/LF | 4,500 |
| Structural Concrete | 98 CY | 400/CY | 39,200 |
| Steel Sheet Piling | 17,700 SF | 20/SF | 354,000 |
| Riprap | 200 CY | 20/CY | 4,000 |
| Access Stairway | 90 LF | 170/LF | 15,300 |
| | | Subtotal | 417,000 |
| | | Mobilization (5%) | 20,900 |
| | | Construction Contingencies (10%) | 41,700 |
| | | Total Construction Cost | $479,600 |
| | | Engineering Design, Administration and Overhead (18%) | 86,400 |
| | | Right of Way Cost | 50,000 |
| | | Total Cost | $616,000 |

# ALTERNATIVE IMPROVEMENT E

## REACH 2

## STATION 998+55 TO STATION 1003+95

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Earthwork<br>Pre-excavation | 540 LF | 15/LF | 8,100 |
| Structural Concrete | 60 CY | 400/CY | 24,000 |
| Steel Sheet Piling | 10,600 SF | 20/SF | 212,000 |
| Access Stairway | 60 LF | 170/LF | 10,200 |
| | | Subtotal | 254,300 |
| | | Mobilization (5%) | 12,700 |
| | | Contstruction Contingencies (10%) | 25,400 |
| | | Total Construction Cost | $292,400 |
| | | Engineering Design, Administration and Overhead (18%) | 52,600 |
| | | Right of Way Cost | 20,000 |
| | | Total Cost | $365,000 |

ALTERNATIVE IMPROVEMENT E

REACH 3

STATION 1003+95 TO STATION 1007+20

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Utility Relocation | | L.S. | 10,000 |
| Pump Station Relocation | | L.S. | 20,000 |
| Earthwork | | | |
| Pre-excavation | 325 LF | 15/LF | 4,900 |
| Embankment | 6,740 CY | 8.00/CY | 54,000 |
| Structural Concrete | 35 CY | 400/CY | 14,000 |
| Steel Sheet Piling | 6,300 SF | 20/SF | 126,000 |
| Access Stairway | 30 LF | 170/LF | 5,100 |
| | | Subtotal | 234,000 |
| | | Mobilization (5%) | 12,000 |
| | | Construction Contingencies (10%) | 23,000 |
| | | Total Construction Cost | $269,000 |
| | | Engineering Design, Administration and Overhead (18%) | 48,000 |
| | | Right of Way Cost | 5,000 |
| | | Total Cost | $322,000 |

## ALTERNATIVE IMPROVEMENT E

## REACH 4

## STATION 1007+20 TO STATION 1010+90

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Utility Relocation | | L.S. | 20,000 |
| Earthwork<br>Pre-excavation | 370 LF | 15/LF | 5,600 |
| Structural Concrete | 45 CY | 400/CY | 18,000 |
| Steel Sheet Piling | 8,000 SF | 20/SF | 160,000 |
| Access Stairway | 90 LF | 170/LF | 15,300 |
| | | Subtotal | 218,900 |
| | | Mobilization (5%) | 10,900 |
| | | Construction Contingencies (10%) | 21,900 |
| | | Total Construction Cost | $251,700 |
| | | Engineering Design, Administration and Overhead (18%) | 45,300 |
| | | Right of Way Cost | 5,000 |
| | | Total Cost | $302,000 |

ALTERNATIVE IMPROVEMENT E

REACH 5

STATION 1010+90 TO STATION 1021+42

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Structural Concrete | 120 CY | 400/CY | 48,000 |
| Steel Sheet Piling | 21,400 SF | 20/SF | 428,000 |
| | | Subtotal | 476,000 |
| | | Mobilization (5%) | 23,800 |
| | | Construction Contingencies (10%) | 47,600 |
| | | Total Construction Cost | $547,400 |
| | | Engineering Design, Administration and Overhead (18%) | 98,600 |
| | | Right of Way Cost | 0 |
| | | Total Cost | $646,000 |

## ALTERNATIVE IMPROVEMENT F

## REACH 1

## STATION 995+57 TO STATION 998+55

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Earthwork | | | |
| Pre-excavation | 298 LF | 25/LF | 7,500 |
| Embankment | 8,740 CY | 8.00/CY | 69,900 |
| Excavation | 1,540 CY | 6.00/CY | 9,200 |
| Structural Concrete | 490 CY | 400/CY | 196,000 |
| Steel Sheet Piling | 26,550 SF | 21/SF | 557,600 |
| Batter Piles | 13,320 LF | 16/LF | 213,100 |
| Access Stairway | 90 LF | 170/LF | 15,300 |

| | |
|---|---|
| Subtotal | 1,068,600 |
| Mobilization (5%) | 53,400 |
| Construction Contingencies (10%) | 106,900 |
| Total Construction Cost | $1,228,900 |
| Engineering Design, Administration and Overhead (18%) | 221,100 |
| Right of Way Cost | 145,000 |
| Total Cost | $1,595,000 |

# ALTERNATIVE IMPROVEMENT F

## REACH 2

## STATION 998+55 TO STATION 1003+95

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Earthwork | | | |
| Pre-excavation | 540 LF | 25/LF | 13,500 |
| Embankment | 4,090 CY | 8.00/CY | 32,700 |
| Excavation | 1,640 CY | 6.00/CY | 9,800 |
| Structural Concrete | 295 CY | 400/CY | 118,000 |
| Steel Sheet Piling | 15,900 SF | 21/SF | 333,900 |
| Batter Piles | 7,950 LF | 16/LF | 127,200 |
| Access Stairway | 60 LF | 170/LF | 10,200 |
| Subtotal | | | 645,300 |
| Mobilization (5%) | | | 32,300 |
| Construction Contingencies (10%) | | | 64,500 |
| Total Construction Cost | | | $742,100 |
| Engineering Design, Administration and Overhead (18%) | | | 133,900 |
| Right of Way Cost | | | 40,000 |
| Total Cost | | | $916,000 |

## ALTERNATIVE IMPROVEMENT F

## REACH 3

## STATION 1003+95 TO STATION 1007+20

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Utility Relocation | | L.S. | 10,000 |
| Pump Station Relocation | | L.S. | 20,000 |
| Earthwork | | | |
| Pre-excavation | 325 LF | 25/LF | 8,100 |
| Embankment | 6,840 CY | 8.00/CY | 54,700 |
| Excavation | 105 CY | 6.00/CY | 600 |
| Structural Concrete | 180 CY | 400/CY | 72,000 |
| Steel Sheet Piling | 9,450 SF | 21/SF | 198,500 |
| Batter Piles | 4,800 LF | 16/LF | 76,800 |
| Access Stairway | 30 LF | 170/LF | 5,100 |
| | | Subtotal | 445,800 |
| | | Mobilization (5%) | 22,300 |
| | | Construction Contingencies (10%) | 44,600 |
| | | Total Construction Cost | $512,700 |
| | | Engineering Design, Administration and Overhead (18%) | 92,300 |
| | | Right of Way Cost | 20,000 |
| | | Total Cost | $625,000 |

ALTERNATIVE IMPROVEMENT F

REACH 4

STATION 1007+20 TO STATION 1010+90

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Roadway Removal | 1,360 SY | 1.50/SY | 2,000 |
| Moving Existing South Bay Yacht Club | | L.S. | 44,000 |
| Utility Relocation | | L.S. | 34,200 |
| Earthwork | | | |
| Pre-excavation | 370 LF | 25/LF | 9,300 |
| Embankment | 4,000 CY | 8.00/CY | 32,000 |
| Excavation | 1,070 CY | 6.00/CY | 6,400 |
| Structural Concrete | 225 CY | 400/CY | 90,000 |
| Steel Sheet Piling | 12,000 SF | 21/SF | 252,000 |
| Batter Piles | 6,000 LF | 16/LF | 96,000 |
| Roadway Replacement | | | |
| 12" Class II Agg. Base | 1,760 SY | 4.50/SY | 7,900 |
| 3" Asphalt Concrete | 1,650 SY | 5.75/SY | 9,500 |
| Access Stairway | 60 LF | 170/LF | 10,200 |
| | | Subtotal | 593,500 |
| | | Mobilization (5%) | 26,700 |
| | | Construction Contingencies (10%) | 59,400 |
| | | Total Construction Cost | $679,600 |
| | | Engineering Design, Administration and Overhead (18%) | 122,400 |
| | | Right of Way Cost | 35,000 |
| | | Total Cost | $837,000 |

## ALTERNATIVE IMPROVEMENT F

### REACH 5

### STATION 1010+90 TO STATION 1021+42

| ITEM | QUANTITY | UNIT COST ($) | COSTS ($) |
|---|---|---|---|
| Earthwork | | | |
| Pre-excavation | 1,152 LF | 25/LF | 28,800 |
| Embankment | 13,480 CY | 8.00/CY | 107,800 |
| Excavation | 7,560 CY | 6.00/CY | 45,400 |
| Structural Concrete | 595 CY | 400/CY | 238,000 |
| Steel Sheet Piling | 53,500 SF | 24.50/SF | 1,310,800 |
| Batter Piles | 16,050 LF | 16/LF | 256,800 |

| | |
|---|---|
| Subtotal | 1,987,600 |
| Mobilization (5%) | 99,400 |
| Construction Contingencies (10%) | 198,800 |
| Total Construction Cost | $2,285,800 |
| Engineering Design, Administration and Overhead (18%) | 411,200 |
| Right of Way Cost | 2,000 |
| Total Cost | $2,699,000 |

# APPENDIX E

# LIST OF TECHNICAL TERMS

# LIST OF TECHNICAL TERMS

cfs or Cubic Feet Per Second - A rate of flow that would fill a container of one cubic foot size, that is about seven and one-half gallons, in one second.

Design Flow - The magnitude of stream flow that is used in design of channel improvements and structures across the channels.

Drainage Area - Area that drains into a body of water such as a stream or a reservoir.

Freeboard - Vertical distance between the top of an embankment adjoining a channel and the water level in the channel. It is a factor of safety designed into a project.

Gabions - Wire baskets filled with graded rocks and gravel. These baskets are used as erosion protection works on channels.

Erosion - Loss of soil from bank or bed of a creek, causing undercutting of banks; ultimate result could be bank failure.

Flood - The temporary inundation of lands normally dry; any waters escaping from a creek or river.

Flood Control Zone - A zone established by the Santa Clara Valley Water District for the purpose of limiting use of tax funds available from a certain area (zone) for improvements and services in that particular area only. There are five flood control zones in Santa Clara County.

Negative Declaration - A determination stating that a proposed project will not have significant adverse environmental impacts. This statement is prepared as required by California Environmental Quality Act.

"n" Value - A coefficient of roughness used in hydraulic computations. Factors influencing the coefficient of roughness for a channel include bed material, bank material, surface irregularity, vegetation, uniformity of cross section, obstructions and alignment.

One Percent Flow - A flow which has a one percent chance of being equaled or exceeded in any year. It is also popularly known as the "100-Year Flow" (See Appendix D).

Reach - One continuous stretch or section of a river or stream.

Subsidence - Loss of ground elevation due to compaction of underground soil layers, primarily caused by overpumpage of groundwater.

Velocity - Speed with which water would flow in a channel. It depends on several factors, such as slope, smoothness and uniformity of channel, area of flow, and wetted perimeter.

Watershed - Area that drains into a body of water such as a stream or a reservoir.

# APPENDIX F

# RESPONSES TO DRAFT NEGATIVE DECLARATION

# RESPONSES TO DRAFT NEGATIVE DECLARATION

## Public Hearing and Comments on Draft Report

On February 24, 1983 a public hearing was held at George Mayne Elementary School on the Engineer's Report and Draft Negative Declaration. At the hearing Mr. Jim Ferguson of the City of San Jose, Mr. Russ Robinson of the South Bay Yacht Club, Mr. Tony Santos, and other individuals spoke in support of the project.

The following pages contain all the written comments received during the review period and District Staff's response to each of those comments; and comments received after the public review period. The comments received during the review period were:

| Date | From | Comments |
|---|---|---|
| 1/26/83 | Dr. Knox Mellon<br>State Historic Preservation Officer | No affect on National Register and/or eligible properties. |
| 2/24/83 | Mr. Roger Johnson<br>Refuge Manager<br>U.S. Fish & Wildlife Service | 1. Favors the recommended alternative (Alt. D-1).<br>2. Install pipe gate at north end.<br>3. Eliminate ramp at Mill Street.<br>4. Limit vehicular access to official purposes. |

RRS

SANTA CLARA
VALLEY WATER DISTRICT

'83 FEB 7 PM 1:18

Dr. Bernard H. Goldner
Project Development Branch
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118

**State of California — The Resources Agency**
**OFFICE OF HISTORIC PRESERVATION**
**DEPARTMENT OF PARKS AND RECREATION**
**P. O. Box 2390**
**Sacramento, CA 95811**
**(916) 445-8006**

FWS820809A

[illegible] 1983

RE: Flood Control Project, Guadalupe River

The item cited above was received in this office on January 26, 1983.
Thank you for consulting us pursuant to 36 CFR 800.

We concur in your determination that this undertaking:

☐ does not involve National Register and/or eligible properties.
X☒ will not affect National Register and/or eligible properties.

An official National Register eligibility determination (36 CFR 63) is unnecessary in cases of no effect. However, the provisions of 36 CFR 800.7 apply if previously unidentified National Register or eligible resources are discovered during construction.

Contact STEPHEN MIKESELL (916)322-8599 of our staff if you have any questions.

**Dr. Knox Mellon**
**State Historic Preservation Officer**

Hand del 2/24

JTO
GSK
DMMC
BHG

# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

San Francisco Bay National Wildlife Refuge Complex
P.O. Box 524
Newark, CA 94560-0524

February 24, 1983

John T. O'Halloran
General Manager
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118

The San Francisco Bay National Wildlife Refuge would like to go on record as favoring Alternative D1 of the proposed project on the Guadalupe River.

The following comments are related to Reaches 1 and 2 of the proposed flood control project.

--- There should be a pipe gate installed at the north end access (marina parking lot) similar to the gate on the east side of the marina parking lot.

--- Since the Service has no immediate plans for the "old boat launching area" and the existing "illegal" docks at the west end of Mill Street, the inboard (east) ramp is not needed by the Refuge. Any future shoreline use, such as a Fish and Wildlife Service boat dock can be serviced by the north access and the out board (west side) ramp. You may therefore exclude this part of the dike from your right of way application.

All vehicle access should be for official or maintenance purposes and should be confined to the top of the dike.

We suggest the use of uniform pipe gates whereever gates are required on the dike such as at the north end of the Catherine Street public dock.

Thank you for the opportunity to comment on this proposal.

Sincerely,

Roger D. Johnson

Roger D. Johnson
Refuge Manager

SANTA CLARA
VALLEY WATER DISTRIC
'83 FEB 24 PM 1:57

Santa Clara Valley Water District Staff Response to Written Comments

1. State of California - Office of Historic Preservation

   No response required.

2. U.S. Fish and Wildlife Service

   The installation of a gate at the Marina parking lot will be included in the detailed design of the project.

   The requested deletion of the inboard (east) ramp at Mill Street is reflected in the final report. The text of the final report has been revised on pages 21, 27, IS-1, IS-9, IS-25, and IS-26 accordingly.

Comments Received After the Public Review Period

The comments received after the review period were:

| Date | From | Comments |
|---|---|---|
| 3/8/83 | Herbert A. Maricle<br>State Lands Commission | 1. Permit PRC 3968.9 could be amended to allow the proposed work.<br>2. Use of public rights-of-way through Fish and Wildlife parcels must be considered.<br>3. County's consent must be obtained for work within their Permit PRC 3628.9. |
| 3/14/83 | William L. Oliver<br>State Public Utilities Commission | PUC Staff has no comments to make. |

STATE OF CALIFORNIA—STATE LANDS COMMISSION

GEORGE DEUKMEJIAN, *Governor*

STATE LANDS COMMISSION
1807 13TH STREET
SACRAMENTO, CALIFORNIA 95814

RHS
3/14

SANTA CLA
ALLEY WATER DIS
'83 MAR 14 PM 1:

March 8, 1983

File Ref.: SD 83-02-01

Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, California 95118

Attention: D. Bernard H. Goldner
Environmental Specialist
Project Development Branch

Gentlemen:

Subject: Santa Clara Valley Water District, Guadalupe River from SPRR to County Marina, Proposed Strengthening and Raising of Existing East Levee and New Levee Construction

This is in reply to your letter dated January 25, 1983, concerning the levee project. A publication entitled "Guadalupe River Planning Study - County Marina to Southern Pacific Railroad - Consisting of The Engineer's Report and Draft Negative Declaration, January 1983", accompanied the letter.

In November 1982, we corresponded with Anderson-Nichols about this levee project as then proposed. The new alignment, however, changes direction along the northerly portion; the comments below are in response to the entire project, as revised.

We are advised that the southern and middle segments of the levee work will run along the existing levee and that the work will be confined to the levee top and its easterly slope. At the north end of the project (north of Elizabeth Street), a new levee will swing east of the existing levee structure, and appears to terminate at the parking lot of the marina. We have divided the work into three areas, and each is discussed in the paragraphs below.

I. First Area -- Southern Segment (Amend Permit PRC 3968.9; Review Lease PRC 3979.1) -- SPRR Tracks to Taylor Street --

A. The State's property boundaries have not been fixed by agreement or judgment in the southern segment.

B. At present, there is an existing permit to the Santa Clara Valley Water District for flood control purposes, Permit PRC 3968.9, for the construction of a flood control channel in the Guadalupe River, extending from the approximate location of the SPRR tracks to the south line of Taylor Street. It is our view that Permit PRC 3968.9 could be amended to include any State Lands Commission interests, within this segment of the project, to allow the proposed work.

C. There is also a current lease to the South Bay Yacht Club at this locale (PRC 3979.1), covering lands claimed by the State, the levee project may affect the lessee's operations as well as impacting fee-claimed parcels of the State.

## II. Second Area -- Middle Segment (Amend Permit PRC 3968.9) -- Taylor Street to Elizabeth Street --

The portion of the levee project extending northerly from the south line of Taylor Street to the south line of Elizabeth Street is in an area where, again, there is no adjudicated or agreed boundary concerning sovereign lands. As above, PRC 3968.9 could be extended to cover the levee work here to include the interests of the State Lands Commission.

## III. Third Area -- Northern Segment (Permit Required, or Amend PRC 3968.9) -- Elizabeth Street to County Marina --

A. Except for the area discussed in sub-paragraph "B" below, that portion of the levee project extending northerly from the south line of Elizabeth Street to the County Marina is landward of State boundary settlement agreements with prior upland owners Jack Ruby (BLA 155) and Florence Comfort (BLA 165). The lands of Ruby and Comfort were subsequently acquired by the United States Government. The former Ruby land is subject to a public right-of-way described in an instrument recorded July 21, 1977, in Volumne D 001, page 487, Santa Clara County Records. The former Comfort land is subject to a public right-of-way described in an instrument recorded November 14, 1979, Volumne E 0941, page 533, Santa Clara County Records. Both recorded instruments bear the following declaration:

> "Said Public Right-of-Way being limited to non-motorized public uses, except for the use by the STATE of Vehicles reasonably for patrol, inspection, administration, repair and/or maintenance of the easement's condition for public use and like purposes."

The State Lands Commission acquired the above use strips (in easement) in favor of the public. Since the proposed levee work would affect the use of the easement strips, and their purposes, such must be treated in the environmental data for the project. We will comment further on this matter as soon as the required information is provided.

B. North of Mill Street, part of the levee project will extend through State land under permit to the County of Santa Clara, Department of Parks and Recreation, Permit PRC 3628.9. The County's consent should be obtained for the use of that area. State approval is necessary as well, either by the issuance of a new, concurrent permit, or by amending permit PRC 3968.9.

Page 18 of the Draft Negative Declaration discusses moorings previously authorized by the State Lands Commission. The only permits issued by the State Lands Commission - for uses within the project limits - are those identified in this letter.

An application should be submitted to the Commission for this project, and may be directed to me for handling. Please call me if you have any questions.

Sincerely,

Herbert A. Maricle

HERBERT A. MARICLE
Land Agent
(916) 322-7822

HAM:ld

cc: D. Sanders

3/16 BHG
ERS

ADDRESS ALL COMMUNICATIONS
TO THE COMMISSION
CALIFORNIA STATE BUILDING
SAN FRANCISCO, CALIFORNIA 94102
TELEPHONE: (415) 557-8536

Public Utilities Commission
STATE OF CALIFORNIA

March 14, 1983

183-43/EIR

FILE NO:

Anna Polvos
Office of Planning and Research
1400 Tenth Street - Room 121
Sacramento, CA 95814

Dear Miss Polvos:

This is in response to Draft Negative Declaration for the "Guadalupe River" Planning Study, County Marina to Southern Pacific Railroad, SCH #83020802.

The staff wishes to inform you that we have no comments to make.

Thank you for allowing us the opportunity to comment on this matter.

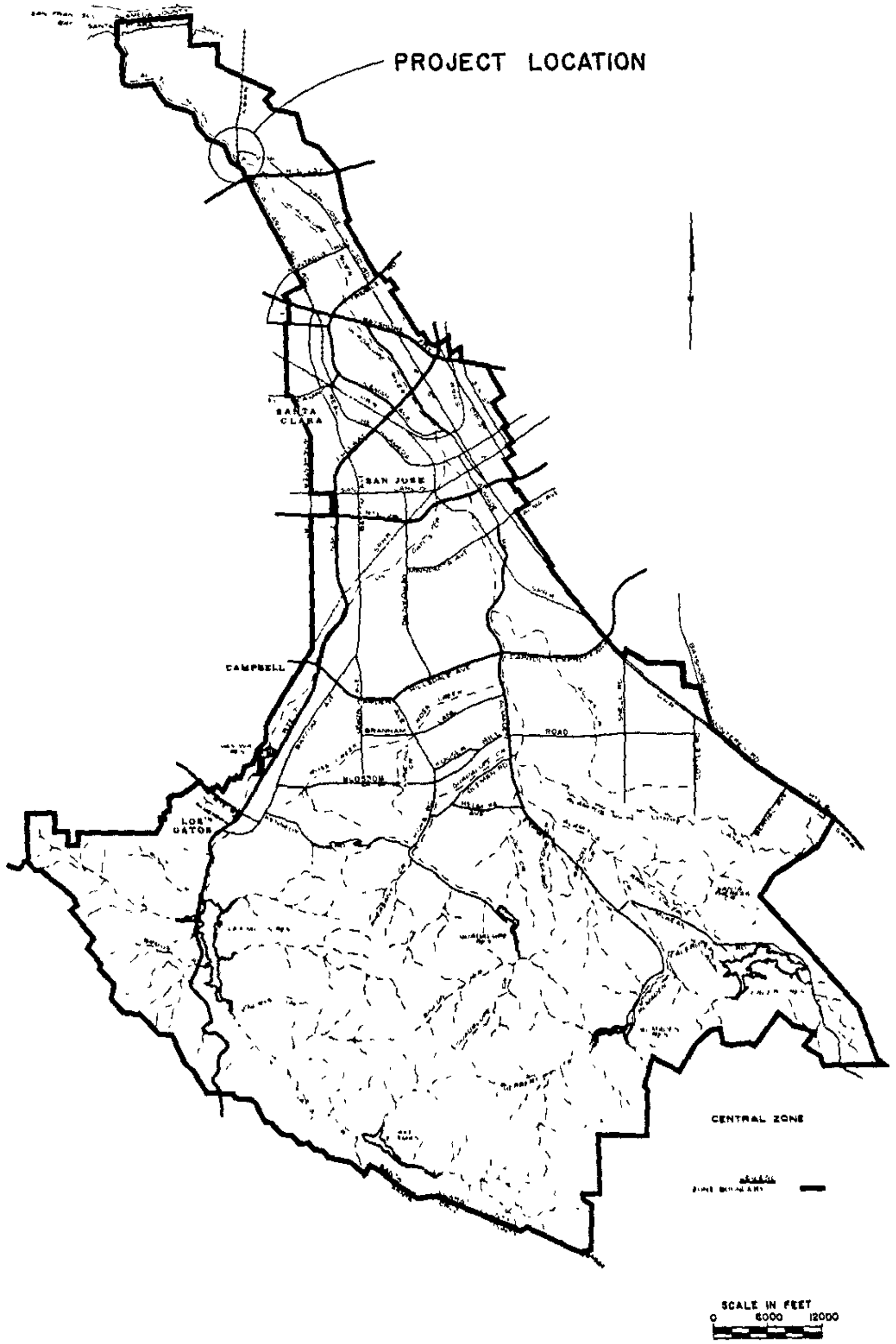
Very truly yours,

WILLIAM L. OLIVER, Principal
Railroad Operations and Safety Branch
Transportation Division

cc: Bernard H. Goldner
    Santa Clara County Water District
    5750 Almaden Expressway
    San Jose, CA 95118

'83 MAR 16 PM 4:33
SANTA CLARA VALLEY WATER DISTRICT

# PLATES



# MAP AND GENERAL PLAN

FOR

# GUADALUPE RIVER

## COUNTY MARINA TO S.P.R.R.

**Santa Clara Valley Water District**

**CENTRAL FLOOD CONTROL ZONE**

**PROJECT NO. 3015**

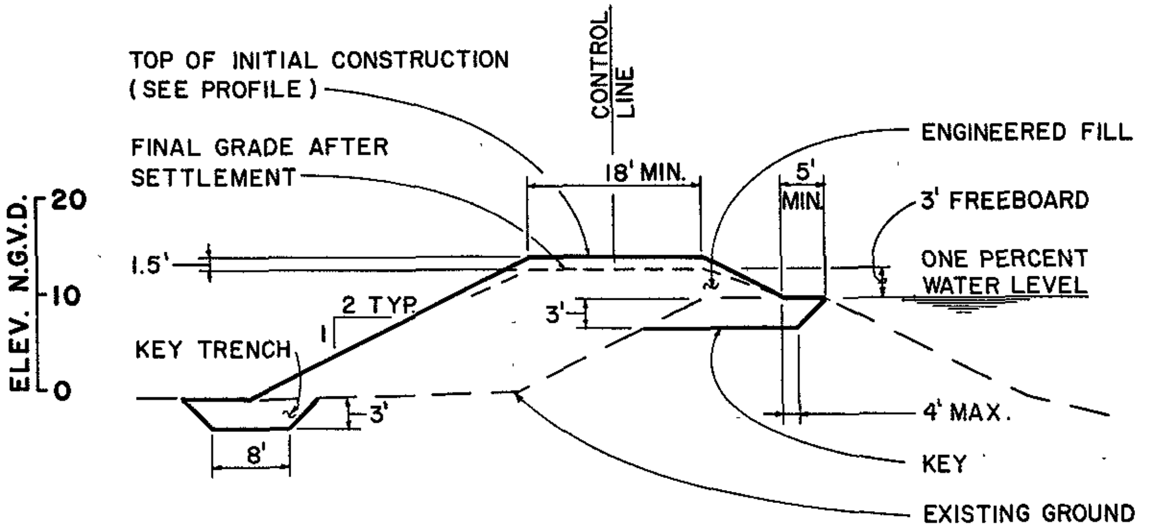
INDEX

| SHEET NO. | DESCRIPTION |
|---|---|
| 1 | MAP & TITLE PAGE |
| 2 | TYPICAL SECTIONS |
| 3 | PLAN 995+57 TO 1000+78 |
| 4 | PLAN 1000+78 TO 1020+14 |
| 5 | PLAN 1020+42 TO 1021+42 |
| 6 | PROFILE |

$\frac{1}{10}$ 1 INDICATES DETAIL NUMBER
10 INDICATES NUMBER OF SHEET ON WHICH DETAIL APPEARS

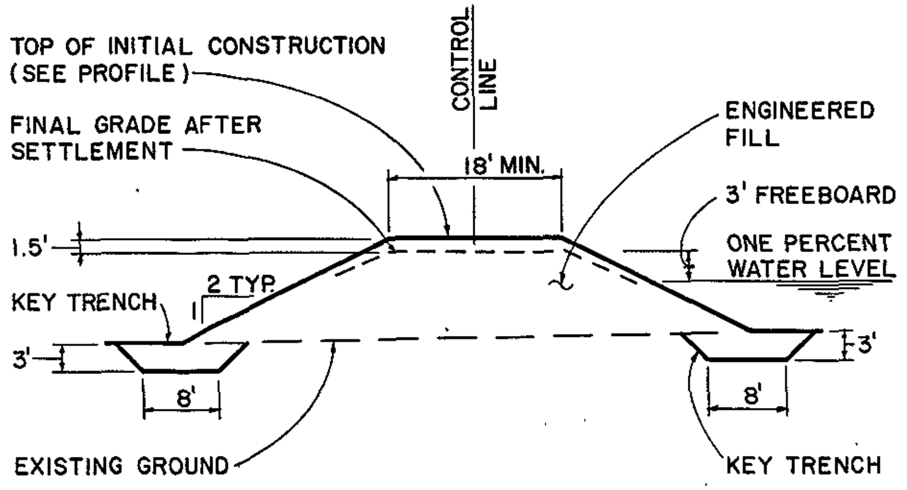
$\frac{A}{10}$ A INDICATES SECTION
10 INDICATES NUMBER OF SHEET ON WHICH SECTION APPEARS

PROJECT APPROVAL:
George Korbay
FLOOD CONTROL MANAGER
DATE 3/8/83



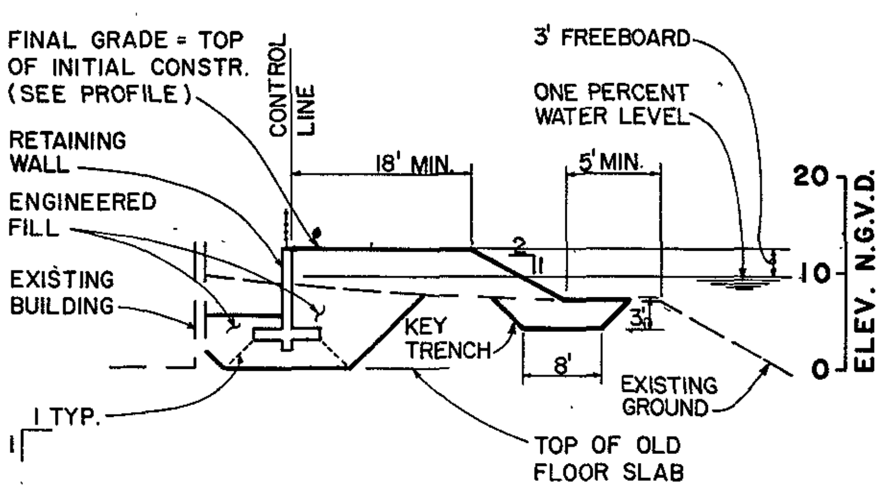
### RAISE EXISTING LEVEE

STA. 995+57± TO STA. 997+10



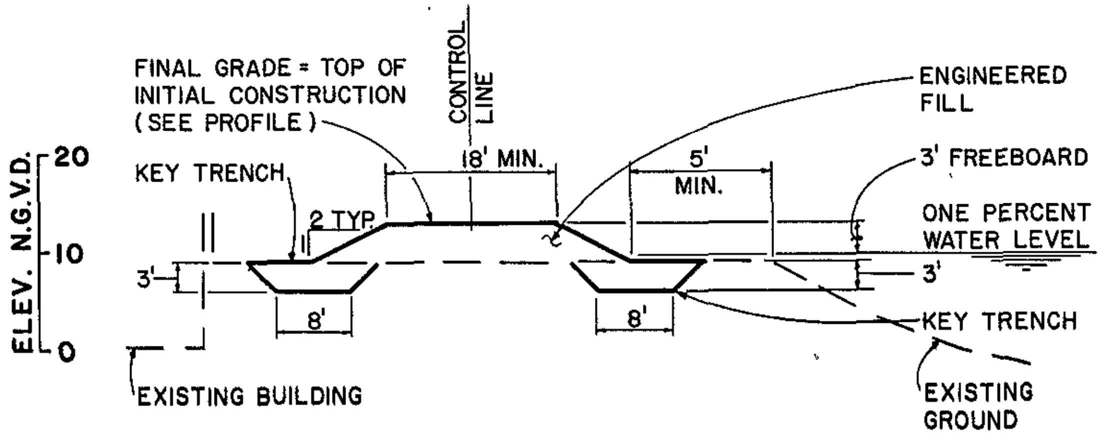
### BUILD NEW LEVEE

STA. 997+10 TO STA. 998+75



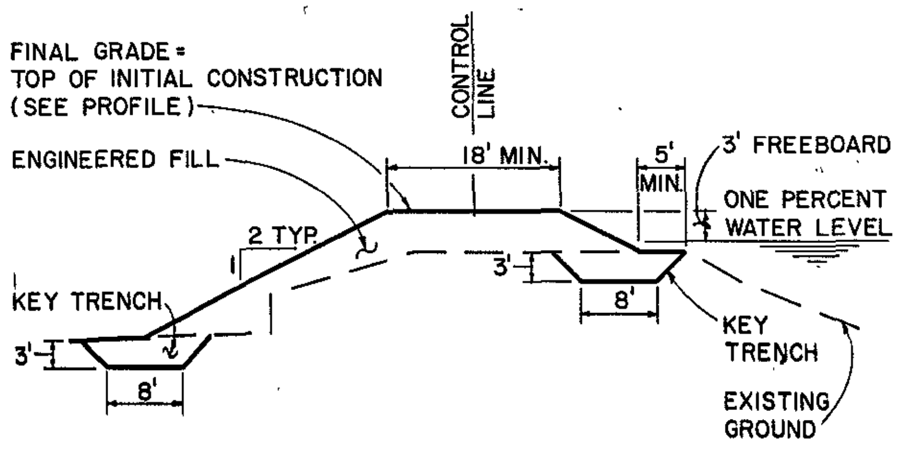
### BUILD NEW LEVEE WITH RETAINING WALL

STA. 998+75 TO STA. 999+40



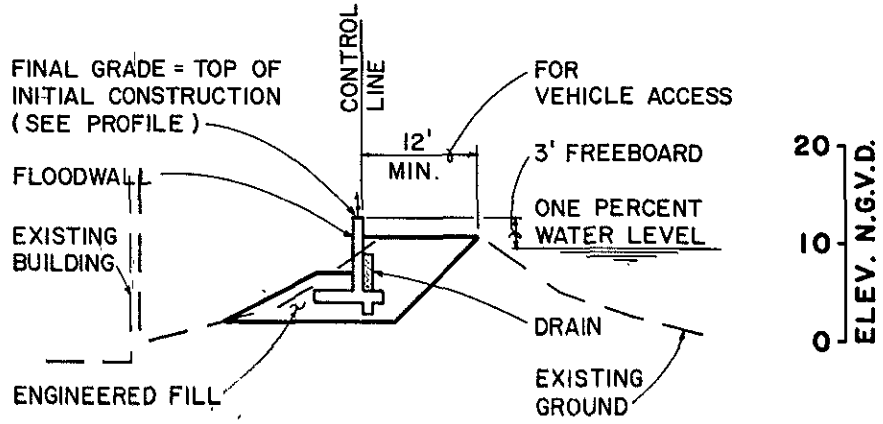
### BUILD NEW LEVEE

STA. 999+40 TO STA. 1000+90



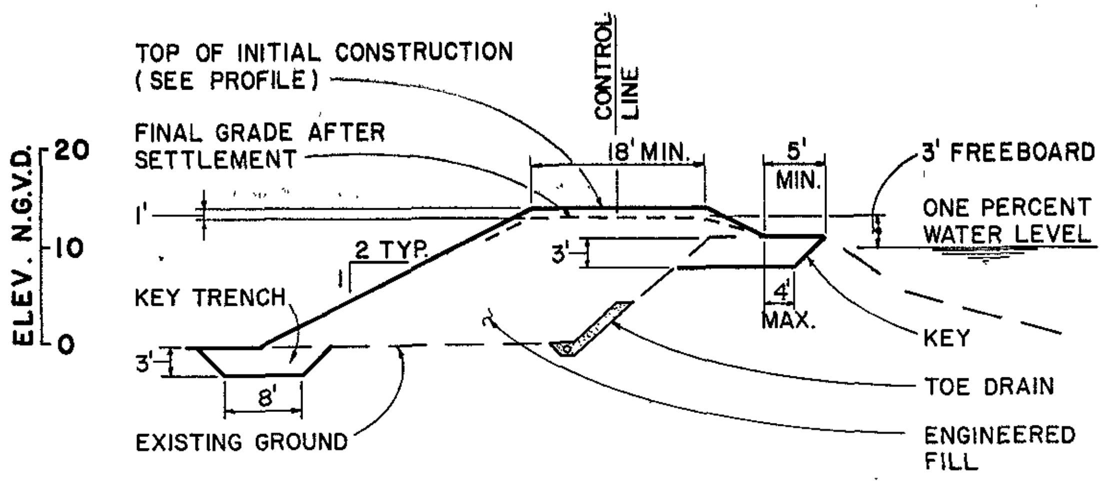
### RAISE EXISTING LEVEE

STA. 1000+90 TO STA. 1002+25



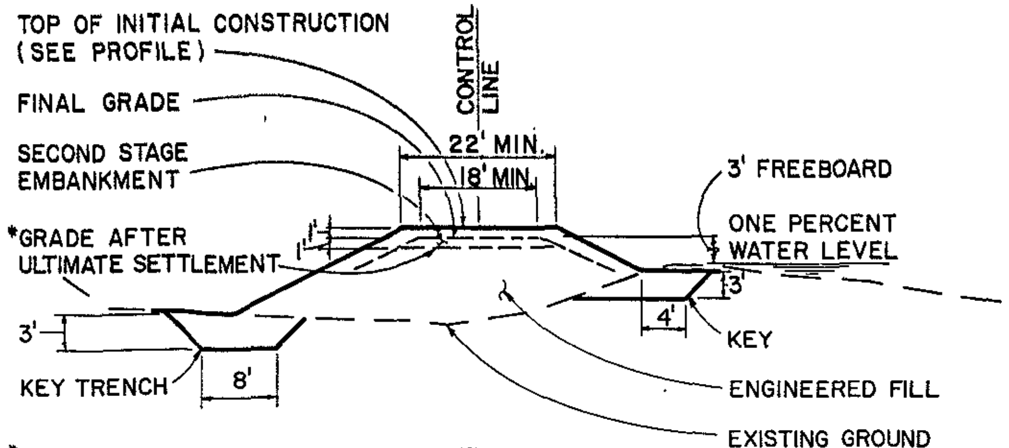
### BUILD NEW FLOODWALL

STA. 1002+25 TO STA. 1003+95



### RAISE EXISTING LEVEE

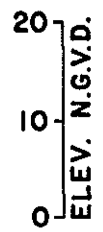
STA. 1003+95 TO STA. 1012+70



*WITHOUT SECOND STAGE EMBANKMENT

### BUILD NEW LEVEE

STA. 1012+70 TO STA. 1021+42±



REDUCED PLAN
USE SCALE BELOW
5 0 10 20

| DESCRIPTION | DATE | APPR |
|---|---|---|
| | | |

REFERENCE INFORMATION AND NOTES
1. DATUM 1929 N.G.V.D.

**Anderson-Nichols**
Engineers • Environmental Consultants • Planners

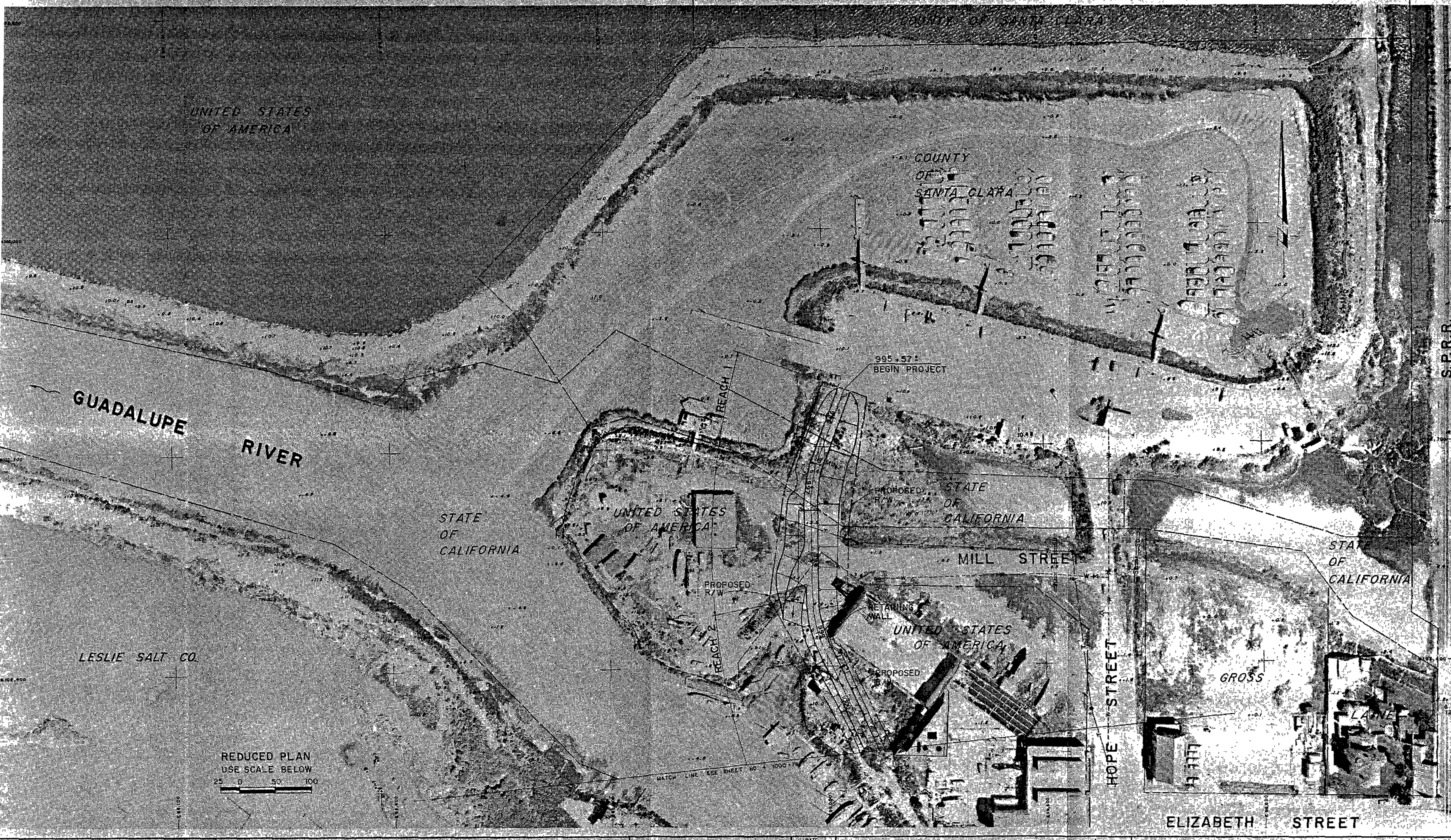
DATE DEC. 1982
DESIGN A.J.W.
DRAWN D.C.
CHECKED A.J.W.

**Santa Clara Valley Water District**

ACCEPTED BY DISTRICT
David M. McNeely 3/8/83
DESIGN DIVISION ENGINEER R.C.E. NO. 18759 DATE

GUADALUPE RIVER
COUNTY MARINA TO S.P.R.R.
TYPICAL SECTIONS

SCALE 1" = 10'
SHEET 2 OF 6



| REFER TO TRACING FOR LATEST REVISION | | | |
|---|---|---|---|
| | DESCRIPTION | SUB. | APPR. |
| | | | |

NOTES:
1. DATUM 1929 N.G.V.D.
2. UTILITIES SHOWN ARE EXISTING.
3. GAS & ELECTRIC SYSTEMS NOT SHOWN.

DATE OF PHOTOGRAPHY 4-22-81

**Anderson·Nichols**
Engineers · Environmental Consultants · Planners

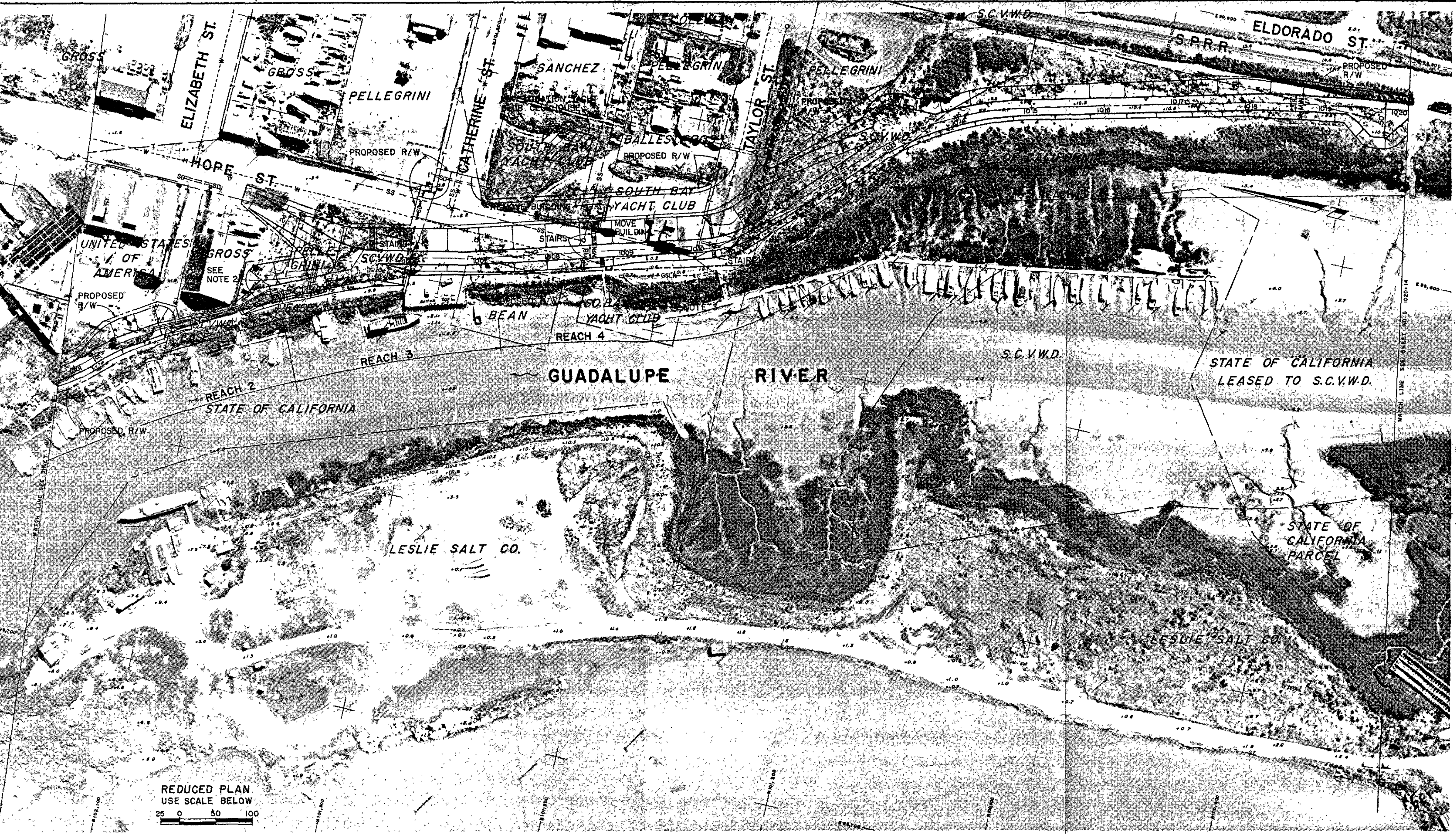
DATE DEC. 1982
DESIGN A. J. W.
DRAWN A. K.
CHECKED A. J. W.

Santa Clara Valley Water District

ACCEPTED BY DISTRICT:
David M McNeely 3/8/83
DESIGN DIVISION ENGINEER R.C.E. NO. 18759 DATE

# GUADALUPE RIVER
COUNTY MARINA TO S.P.R.R.
## PLAN
995+57 TO 1000+78

SCALE 1" = 60'
SHEET 3 OF 6



REFER TO TRACING FOR LATEST REVISION

| DESCRIPTION | SUB | APPR |
|---|---|---|
| | | |

NOTES
1 DATUM 1929 N G V D.
2 LOCATE, CUT, & PLUG ABANDONED PETROLEUM PIPES NUMBER, SIZE, & EXACT LOCATION UNKNOWN
3 EXISTING BURRIED 550 GAL STEEL GASOLINE TANK, PUMP, & PIPELINE SHALL BE PROTECTED FROM DAMAGE
4 UTILITIES SHOWN ARE EXISTING.
5 GAS & ELECTRIC SYSTEMS NOT SHOWN.

**Anderson·Nichols**
Engineers • Environmental Consultants • Planners

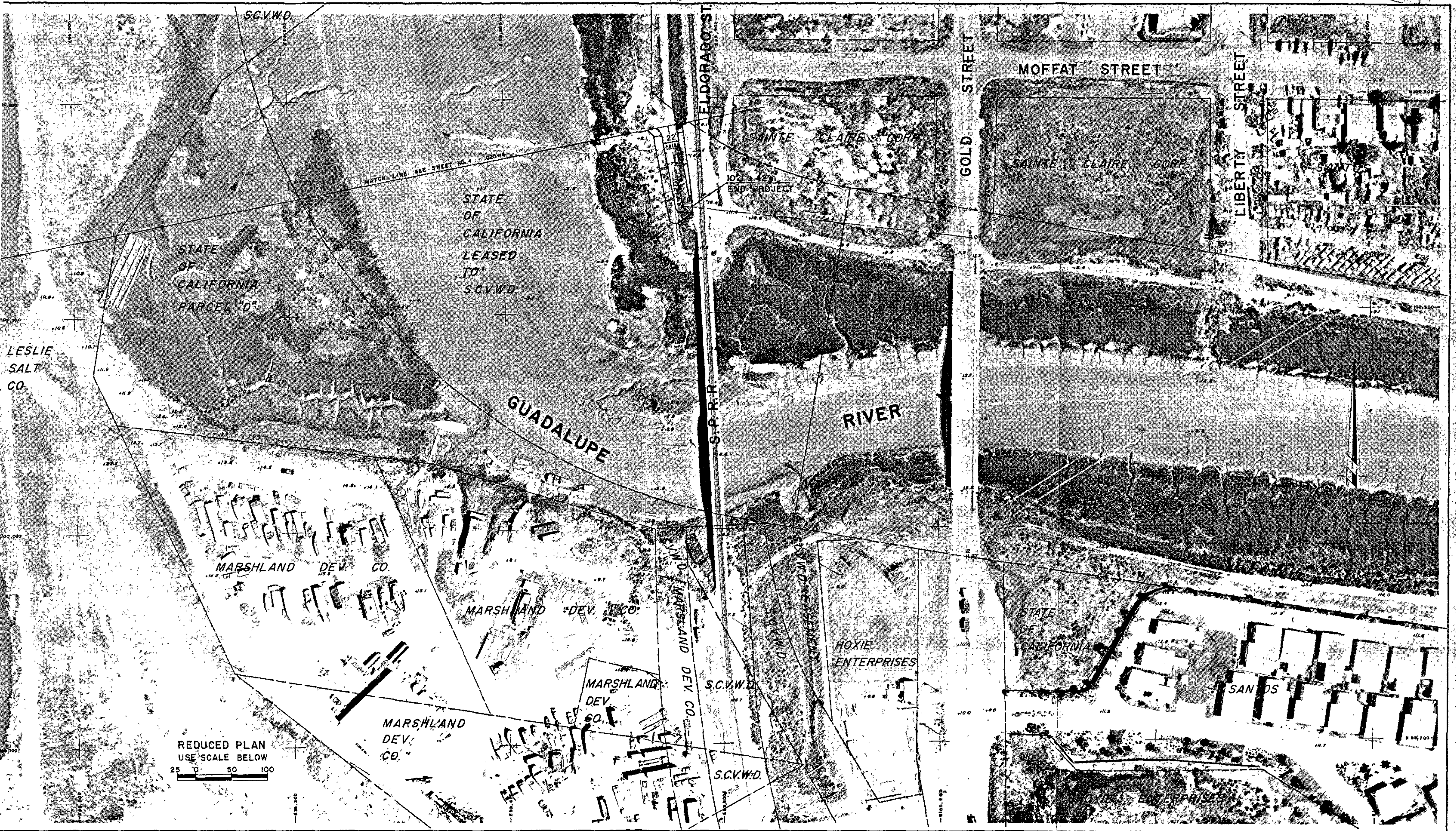
DATE DEC. 1982
DESIGN A. J. W.
DRAWN P. A. H.
CHECKED A. J. W.

**Santa Clara Valley Water District**

ACCEPTED BY DISTRICT:
David M McHealy
DESIGN DIVISION ENGINEER R C E. NO. 18759 DATE 3/9/83

GUADALUPE RIVER
COUNTY MARINA TO S.P.R.R.
PLAN
1000+78 TO 1020+14

SCALE 1"= 60'
SHEET 4 OF 6



| REFER TO TRACING FOR LATEST REVISION | | |
|---|---|---|
| DESCRIPTION | SUB | APPR |
| | | |

NOTES
1 DATUM 1929 N.G.V.D

**Anderson·Nichols**
Engineers • Environmental Consultants • Planners

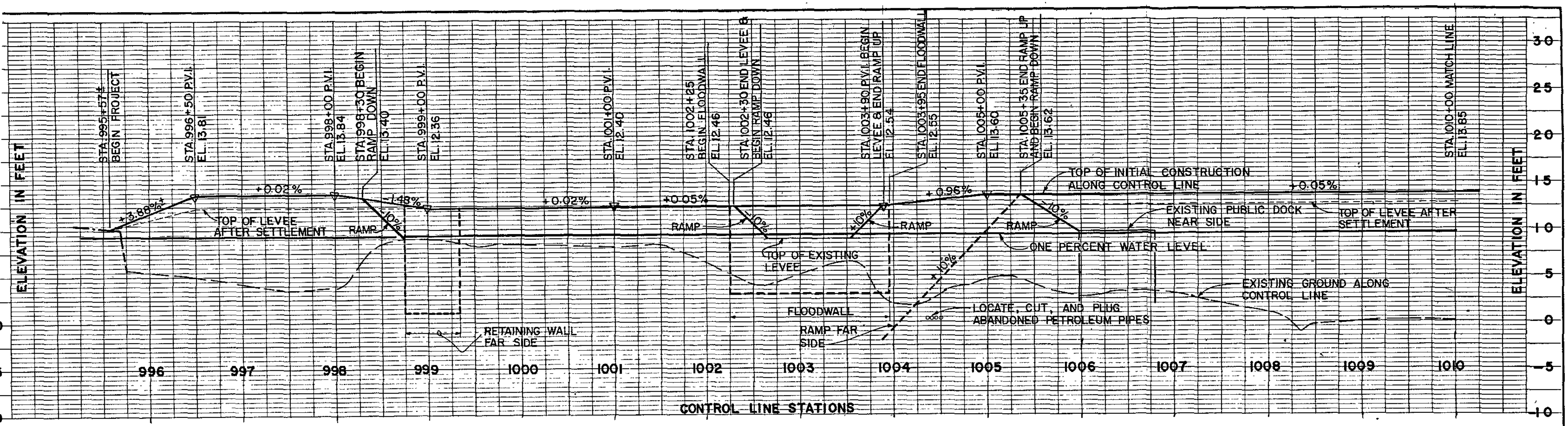
| | |
|---|---|
| DATE | DEC. 1982 |
| DESIGN | A.J.W. |
| DRAWN | D.C. |
| CHECKED | A. J. W. |

**Santa Clara Valley Water District**

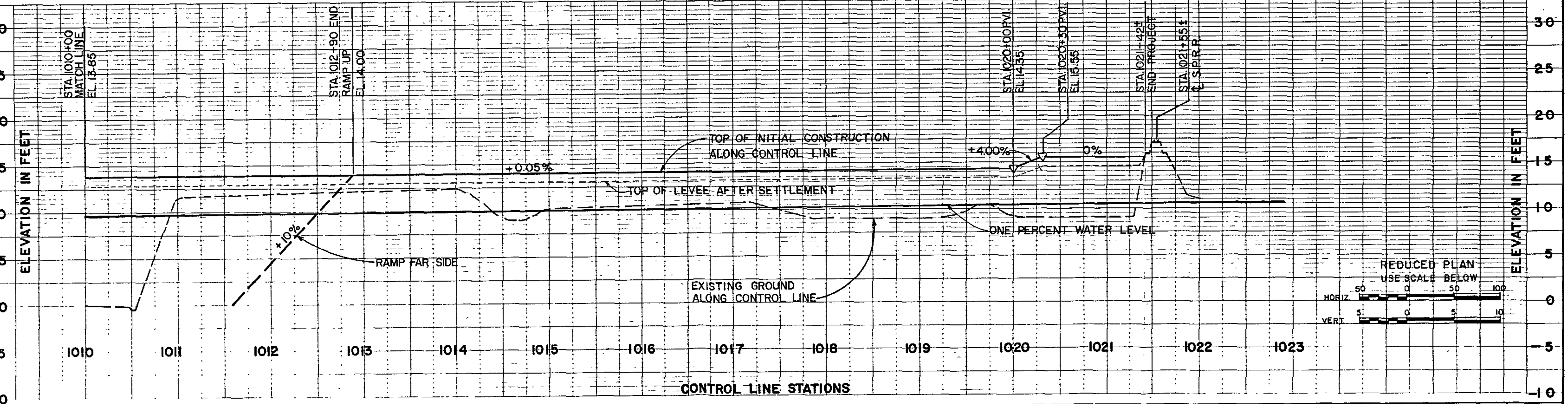
ACCEPTED BY DISTRICT:
David M McNeely 3/8/83
DESIGN DIVISION ENGINEER R.C.E. NO 18759 DATE

# GUADALUPE RIVER
COUNTY MARINA TO S.P.R.R.
## PLAN
1020+14 TO 1021 + 42

SCALE 1" = 60'
SHEET 5 OF 6



ELEVATION IN FEET
30
25
20
15
10
5
0
-5
-10
STA. 995+57± BEGIN PROJECT
STA. 996+50 P.V.I. EL. 13.81
STA. 998+00 P.V.I. EL. 13.84
STA. 998+30 BEGIN RAMP DOWN EL. 13.40
STA. 999+00 P.V.I. EL. 12.36
STA. 1001+00 P.V.I. EL. 12.40
STA. 1002+25 BEGIN FLOODWALL EL. 12.46
STA. 1002+30 END LEVEE & BEGIN RAMP DOWN EL. 12.46
STA. 1003+90 P.V.I. BEGIN LEVEE & END RAMP UP EL. 12.54
STA. 1003+95 END FLOODWALL EL. 12.55
STA. 1005+00 P.V.I. EL. 13.60
STA. 1005+35 END RAMP UP AND BEGIN RAMP DOWN EL. 13.62
STA. 1010+00 MATCH LINE EL. 13.85
+3.88%
+0.02%
-1.48%
+0.02%
+0.05%
+0.96%
+0.05%
10%
+10%
TOP OF LEVEE AFTER SETTLEMENT
RAMP
TOP OF INITIAL CONSTRUCTION ALONG CONTROL LINE
EXISTING PUBLIC DOCK NEAR SIDE
TOP OF LEVEE AFTER SETTLEMENT
ONE PERCENT WATER LEVEL
TOP OF EXISTING LEVEE
FLOODWALL
RAMP FAR SIDE
RETAINING WALL FAR SIDE
LOCATE, CUT, AND PLUG ABANDONED PETROLEUM PIPES
EXISTING GROUND ALONG CONTROL LINE
996
997
998
999
1000
1001
1002
1003
1004
1005
1006
1007
1008
1009
1010
CONTROL LINE STATIONS



ELEVATION IN FEET
30
25
20
15
10
5
0
-5
-10
STA. 1010+00 MATCH LINE EL. 13.85
STA. 1012+90 END RAMP UP EL. 14.00
STA. 1020+00 P.V.I. EL. 14.35
STA. 1020+30 P.V.I. EL. 15.55
STA. 1021+42± END PROJECT
STA. 1021+55± ℄ S.P.R.R.
TOP OF INITIAL CONSTRUCTION ALONG CONTROL LINE
+0.05%
+4.00%
0%
TOP OF LEVEE AFTER SETTLEMENT
ONE PERCENT WATER LEVEL
+10%
RAMP FAR SIDE
EXISTING GROUND ALONG CONTROL LINE
REDUCED PLAN USE SCALE BELOW
HORIZ. 50 0 50 100
VERT. 5 0 5 10
1010
1011
1012
1013
1014
1015
1016
1017
1018
1019
1020
1021
1022
1023
CONTROL LINE STATIONS

| | DESCRIPTION | DATE | APPR |
|---|---|---|---|
| | | | |

NOTES:
1. DATUM 1929 NGVD.

**Anderson·Nichols**
Engineers • Environmental Consultants • Planners

| | |
|---|---|
| DATE | DEC. 1982 |
| DESIGN | A. J. W. |
| DRAWN | P. A. H |
| CHECKED | A. J. W. |

**Santa Clara Valley Water District**

ACCEPTED BY DISTRICT:
David M. McNulty 3/8/83
DESIGN DIVISION ENGINEER R.C.E. NO 18759 DATE

# GUADALUPE RIVER
COUNTY MARINA TO S.P.R.R.
# PROFILE

SCALE
1" = 50' HORIZ.
1" = 5' VERT.
SHEET
6
OF 6